



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

THE SEPTONATE
AND THE
CENTRALIZATION
OF THE
TONAL SYSTEM

JULIUS KLAUSER

GENERAL LIBRARY

OF

University of Michigan

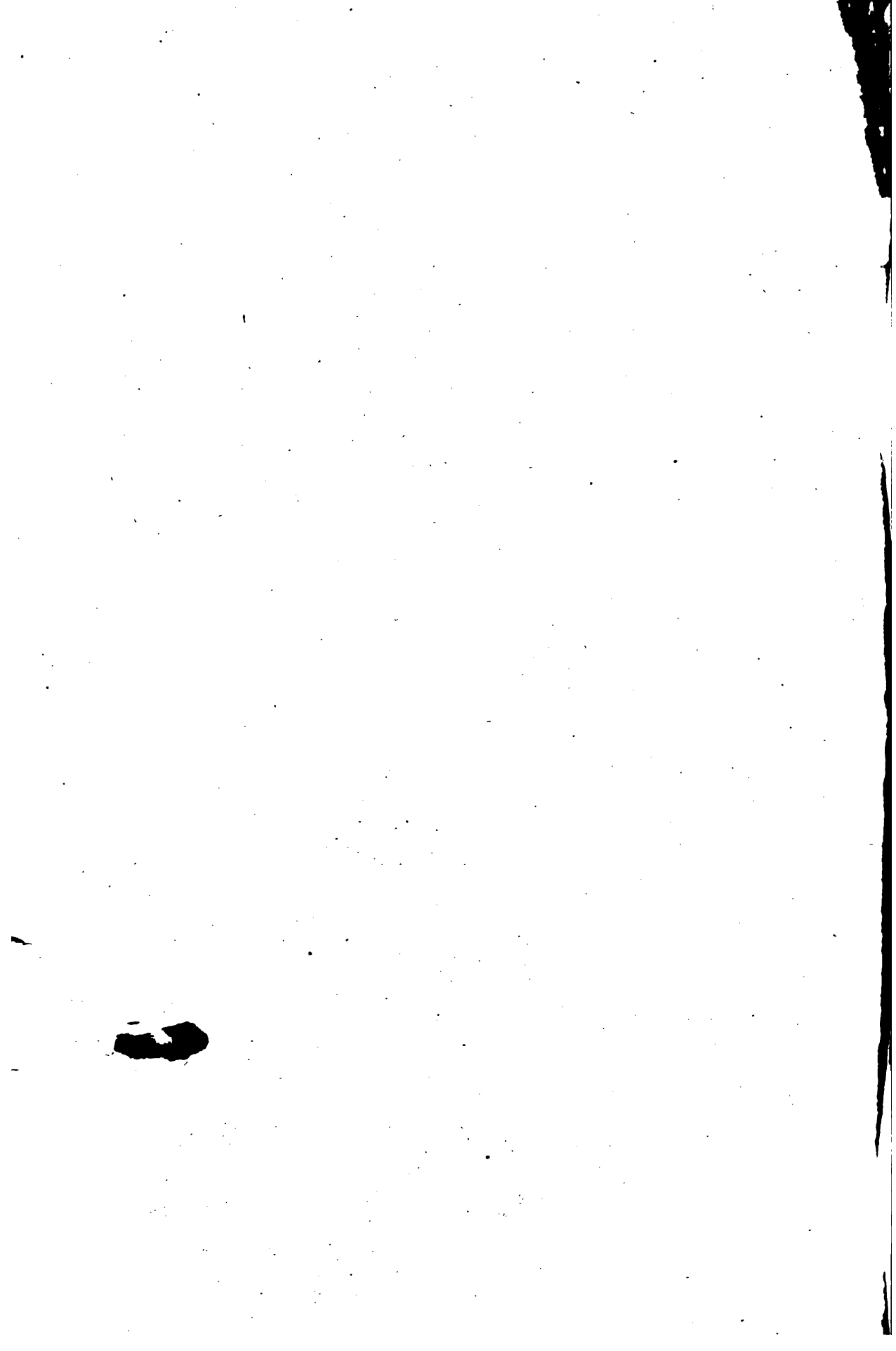
Presented by

Prof. A. A. Stanley

Oct.

1900





THE SEPTONATE
AND THE *972-64*
CENTRALIZATION OF THE
TONAL SYSTEM

A New View
OF THE
FUNDAMENTAL RELATIONS OF TONES AND A SIMPLIFICATION
OF THE THEORY AND PRACTICE OF MUSIC

WITH AN INTRODUCTION ON

A Higher Education in Music

BY
JULIUS KLAUSER

MILWAUKEE:
WILLIAM ROHLFING AND SONS
1890

1890

11
3503
K63

COPYRIGHT 1890, JULIUS KLAUSER.

ALL RIGHTS RESERVED.

KING, FOWLE & Co.,
PRINTERS AND ELECTROTYPERS,
MILWAUKEE, WIS.

transfer to
Music
1-4-66

DEDICATION AND PREFACE.

To

KARL KLAUSER,

Farmington, Conn.

My dear Father : With a heart full of gratitude for the love of serious and unflagging work which you have instilled in me by your eminent example, and with a sense of profound esteem, I inscribe my first book to one whose rank among the foremost of music artists, thinkers, and educators, has been recognized the musical world over for nearly half a century.

As you know, I have devoted much time and thought to the simplification of the study and practice of music: my scheme for a new treatment of the Piano, which, ten years ago, I communicated to you and Mr. Wm. Mason, was afterward executed, but failed to satisfy me and was not published. Once on the path of inquiry in search of fundamental principles, exact definitions, and more simple, logical, and direct methods, I felt that the consideration of certain other questions was more important—questions that had occupied my mind long before my conception of a new treatment of the Piano.

Recognizing, many years ago, the facts that there was no established science of music; that, in the theory, composition, expression, education, and criticism of music, it was the universal custom to appeal to the dictates of a refined musical sense whenever the rules were violated or whenever there were no rules; and experimentally proving the fact that the musical relations of tones, harmonies, and rhythms, were felt, heard, and thought alike by all musical individuals of every age, of every degree of endowment, and of every stage of development: I decided to undertake an exact psychological analysis of the musical sense and faculties, of the

primal relations of tones, and of the inter-relations of rhythm, melody, and harmony, believing that such an analysis would not only simplify the study and practice of music but might possibly result in the simplification of the Tonal System and thus simplify music theory, and might even disclose the true principles of the science of music.

That such an exact analysis meant nothing more nor less than an exact analysis of the musical relations of tones, harmonies, and rhythms, exactly as they are felt, heard, and thought, was an obvious conclusion; and, upon further investigation, I also came to the conclusion that the psychology of music was distinctively *music-psychology*; that exact *musico-psychological* analyses could not be made by any one but a musician; hence, that *music-psychology*, like the physics of music, is a distinct branch of the science of music. Both of these sciences await development by scientific musicians.

As years passed on, my investigations involved me in the entire field of musical research, and my topics and materials grew too numerous and unwieldy to arrange for a single publication. Four years ago, I decided to extract the subject of this volume from my larger work, for separate treatment. Fifteen years ago, I began to analyze the scale-halves, or tetrachords that divide the scale into two equal halves; my conception of the Tonic as a *central* tone and of the Septonate soon followed, and, *Centralization* once begun, the entire System and all theoretical problems at once became implicated.

Through musico-psychological analyses, I claim to have presented musical relations as they are and always have been felt, heard, and thought; to have discovered in the scale-half and Septonate an important chapter preceding the scale; to have added new principles to music; and to have erected a new structure of the Tonal System.

In order further to emphasize the educational side of my new ideas, I have introduced the subject proper by a brief essay on music education.

Your affectionate son,

JULIUS KLAUSER.

MILWAUKEE, WIS.,
July, 1890.

TABLE OF CONTENTS.

INTRODUCTION.

Page.

A Higher Education in Music	9
---------------------------------------	---

THE SEPTONATE

AND THE

CENTRALIZATION OF THE TONAL SYSTEM.

CHAPTER I.

STATEMENT OF POSITION.

Tones as We Think and Hear Them	37
The Sense of Harmony and the Sense of Rhythm	40
The Principle of Progression	41
The Key and its Klangs	41
The Position of a Tonic	42
The Seven Principals	42
Definition of the Word <i>Septonate</i>	43
The Scale-half	43
The Septonate and the Scale	44
The Keygroup	49
The Tone-Stratum	50
The Small Keygroup and the Large Keygroup	50
Centralization	50
Centralization of Tonics and Keys	51
Major and Minor Modes	51
Summary of the Tones Employed in Music	51

CHAPTER II.

THE PRINCIPLE OF PROGRESSION,

HARMONICALLY AND RHYTHMICALLY CONSIDERED.

Harmonic Progressions	53
Rhythmical Progressions	59
Rhythmo-Harmonic Progressions	65

primal relations of tones, and of the inter-relations of rhythm, melody, and harmony, believing that such an analysis would not only simplify the study and practice of music but might possibly result in the simplification of the Tonal System and thus simplify music theory, and might even disclose the true principles of the science of music.

That such an exact analysis meant nothing more nor less than an exact analysis of the musical relations of tones, harmonies, and rhythms, exactly as they are felt, heard, and thought, was an obvious conclusion; and, upon further investigation, I also came to the conclusion that the psychology of music was distinctively *music-psychology*; that exact *musico-psychological* analyses could not be made by any one but a musician; hence, that *music-psychology*, like the physics of music, is a distinct branch of the science of music. Both of these sciences await development by scientific musicians.

As years passed on, my investigations involved me in the entire field of musical research, and my topics and materials grew too numerous and unwieldy to arrange for a single publication. Four years ago, I decided to extract the subject of this volume from my larger work, for separate treatment. Fifteen years ago, I began to analyze the scale-halves, or tetrachords that divide the scale into two equal halves; my conception of the Tonic as a *central* tone and of the Septonate soon followed, and, *Centralization* once begun, the entire System and all theoretical problems at once became implicated.

Through musico-psychological analyses, I claim to have presented musical relations as they are and always have been felt, heard, and thought; to have discovered in the scale-half and Septonate an important chapter preceding the scale; to have added new principles to music; and to have erected a new structure of the Tonal System.

In order further to emphasize the educational side of my new ideas, I have introduced the subject proper by a brief essay on music education.

Your affectionate son,

JULIUS KLAUSER.

MILWAUKEE, WIS.,
July, 1890.

TABLE OF CONTENTS.

INTRODUCTION.

	<i>Page.</i>
A Higher Education in Music	9

THE SEPTONATE

AND THE

CENTRALIZATION OF THE TONAL SYSTEM.

CHAPTER I.

STATEMENT OF POSITION.

Tones as We Think and Hear Them	37
The Sense of Harmony and the Sense of Rhythm	40
The Principle of Progression	41
The Key and its Klangs	41
The Position of a Tonic	42
The Seven Principals	42
Definition of the Word <i>Septonate</i>	43
The Scale-half	43
The Septonate and the Scale	44
The Keygroup	49
The Tone-Stratum	50
The Small Keygroup and the Large Keygroup	50
Centralization	50
Centralization of Tonics and Keys	51
Major and Minor Modes	51
Summary of the Tones Employed in Music	51

CHAPTER II.

THE PRINCIPLE OF PROGRESSION,

HARMONICALLY AND RHYTHMICALLY CONSIDERED.

Harmonic Progressions	53
Rhythmical Progressions	59
Rhythmo-Harmonic Progressions	65

CHAPTER III.

THE SCALE-HALF, THE SEPTONATE, AND THE SCALE.

Page.

An Analysis	75
-----------------------	----

CHAPTER IV.

INTERVALS OR MELODIES OF STEPS.

Analysis and Classification	111
Some Observations on Voice Culture	129
The Numbers and Letters of Intervals	141
The First Group of Intervals	143
The Second Group of Intervals	144
The Third Group of Intervals	151
Complete Summary of the Intervals in Music	154

CHAPTER V.

HARMONY.

Analysis and Classification of Chords, or Combinations of Keyklangs	157
The Tonic-Harmony, or the Harmony of the Key-Center	167
Classification of Chords	185
Threeklangs of the First Relationship	192
Consonant and Dissonant Chords	209
The Dissonant Harmony	215

CHAPTER VI.

SUSPENSION : CENTRALIZATION AND INTER-RELATIONS OF KEYS :

MODULATION : CONCLUSION.

Suspension	223
Supplementary Remarks on the Tone-Stratum	230
Centralization of Keys	232
Inter-relations of Keys	236
A Provisional Simplification of Notation	243
Modulation	252
Conclusion	265

INTRODUCTION.

A HIGHER EDUCATION IN MUSIC.

INTRODUCTION.

A HIGHER EDUCATION IN MUSIC.

EVERY serious-minded musician has a share in the work of elevating the standard of musical intelligence, and the problem of raising this standard both in the public and in the profession faces him every hour of the day. Whether he is an amateur or a professional, he is always an educator, inasmuch as his influence is felt in his community, and this means just so much good in the long run. From year to year there is a slow advance, on the one hand in the quality of what the public wants and demands, on the other hand in the quality of what the profession supplies. I need hardly mention that in this connection reference is not made to that large proportion of the profession that regards the relations of demand and supply in music on a basis of trade.

What is greatly to be desired and is most needed is a higher plane of musical education. The relations of music and society at large are not difficult to observe. The public must and will have what it wants, and every musician knows that the general public is best contented with a low class of music. Roughly speaking, the poorer the class of music, the larger the number of applauders; the finer the class of music, the fewer the number of applauders. However, analysis will show that this verdict is not altogether just, inasmuch as the popular taste for *light* music does not necessarily mean a taste for poor music. Just as there is good music all the way from light to complex, so also there is poor music all the way from light to complex. Popular taste does not and can not discriminate between the good and the bad in light music, and when it comes to complex music the pale of popular appreciation is overstepped. Presently we shall investigate the nature of the musical faculties, whereupon it will become plain that the public at large depends entirely on intuition for its musical enjoyments; moreover, that this intuitive appreciation is limited to simple mel-

ody, simple harmony and simple rhythm in simple forms. Appreciation and hence enjoyment of everything beyond the simple and the light requires direct education. Meanwhile, it may be stated that the public can enjoy sonatas and symphonies, because the sonatas and symphonies of Mozart, Haydn, Beethoven, Schubert, and Mendelssohn contain a great deal of light and simple music in song and dance forms, and the works of this class that contain the greatest number of such simple parts and episodes are the most popular. All such movements and episodes in chamber and symphony music come under the head of light music, and therefore the public can appreciate the best class of light music. All this does not liberate popular taste from the charge that it is best contented with a low class of music, for the fact remains that the public does not know the difference between the good and the bad. The case is a plain one. The public will have what it wants ; the public does not want the best. The remedy for these conditions is manifest. The quality of what the public wants must be improved. This is the business of the music instructor. Better teaching, better performances, a better class of music will become more and more common in exact proportion to the improvement in the quality of the public demand.

It is as easy as it is cheap to rail over and criticise the defects in existing conditions, but unless such criticisms are supplemented by pointing out their causes and by suggesting proper remedies, they are worse than worthless. The defects in social conditions in relation to music appear in the class of music, in the class of musicians and teachers, and in the class of performances that are in greatest demand, and the nature of this demand is due, in the main, to the methods of music education. That the word *education* loses some of its dignity when applied to such methods will become obvious in the following summary : that this word should be made to apply to music with all its potency and dignity no one will question.

There is no other art or science that has so many votaries as music ; no other art or science of which intelligent society is so ignorant, for society knows little about the comparative merits of its works and of its workers ; and yet there is no other art upon whose works and workers society is so ready to pronounce its opinions :

As a consequence, there is no other profession that is so full of impostors, charlatans and dilettanti, and no other class of charlatans that so brazenly and successfully take advantage of the public ignorance :

There is no other branch of education that is carried on with

such a diversity of methods for the same ends and with such a conflict of notions :

There is no other branch of education that so completely ignores accepted pedagogical and psychological ground-principles:

There is no other study over which so much energy, time, and money are spent to so little purpose and with such meager returns in the way of intelligence:

There is no other study over which such an incalculable amount of energy, time, and money is so indiscriminately wasted:

There is no other study that is kept up under the supervision of a teacher for so many successive years—the average being from eight to ten years :

There is no other study in which theory is so completely separated from practice, and therefore, no other study in which a student learns so little or nothing of the *what* and of the *why* of things :

As a consequence, there is no other class of students in which the student is so ignorant of his subject, is trained so blindly and is kept in such an utter state of dependence on his master's judgment :

As an unavoidable consequence of all this, no other art or science is subjected to so much volatile and verbose opinionating by both public and profession.

With all due regard for improved methods of instruction, music is still taught and studied on a basis of *indiscrimination*. In plain language, students are not taught nor do they learn to *hear*: they are musically *deaf*. An individual is deaf in this sense when he can not tell you what the intervals, chords, rhythms, measures, and meters are that you dictate for oral discrimination. This describes the case of the average music student ; no matter what branch of music, where and how many years he may have studied, he is deaf to the simplest relations in which tones occur. Moreover, ask the average student for definitions of a tone, of melody, of harmony, of rhythm, of modulation, of a phrase, and the like, and you will find that he knows little or nothing of all these essentials. This examination might be prolonged indefinitely with the same results, namely, you would find an astonishing lack of tone-discrimination and general musical intelligence, yet the examinee may have studied music for ten, fifteen and in some instances even for twenty years and more. What has he learned during all this time ? He has learned to sing and to play. What does he know ? If he has had four teachers he knows four methods of producing the same vowel-sound and the same touch, he has become coated with a thin

veneer of knowledge of technical terms, of matters concerning the manipulation of his instrument, of compositions, and, perchance, of a few historical facts. The average teacher thinks it necessary to develop a method of his own lest he might be condemned for lack of individuality and originality. This is an unfortunate error, and results in the confusion of those students that are obliged to shift about from one teacher to another, or that study with two or more teachers at the same time on the Conservatory plan. There are fundamental principles in all things and, without overlooking the fact that the individuality of a pupil must be considered, there is a right way which is the best way. The one reason that the average student has for singing or playing in this or that way is "my teacher said so." We sorely need proper methods and fundamental principles in music.

A higher education in music is possible only on the basis of *discrimination*. The student must be taught and must learn to hear. The desirability of a higher education no one will question, anything being desirable that will improve existing conditions. I shall devote this introduction to urging the necessity of a higher education and to demonstrating its practicability; its necessity may be based on the simple ground that rational beings should do things in rational ways, and its practicability will appear when we consider rational methods.

The position is briefly as follows: nature does so much for the individual and education does, comparatively, so little.

Certain incongruous facts forced themselves upon my observation and perplexed me even when a school-boy. In the main they are the following:

On the one hand, the love of music is universal: musical talent is abundant and ubiquitous: the precocity of the musical faculties in children is without a parallel: the army of music students and teachers is enormous: the amount of time and work expended in the study of music is incalculably great.

On the other hand, the acquisition of even a moderate degree of proficiency in any branch of music is extremely difficult, costing years of hard work; again, discrimination and intelligence in students of music and in the larger proportion of the profession, are far below the average.

The conflict of these facts is apparent. Where love, talent, and precocity are so abundant, it certainly seems strange that learning should be so difficult. Where such a multitude are at work and

work so long and hard, it is remarkable that so little in the way of discrimination and intelligence is gained. There is so much music and so much musical talent and activity that Professor Bain was provoked to the statement that music is "cheap." There is something wrong somewhere, and on first thought it would seem that the wrong must lie in the methods of educators. It does to a large extent. The most vulnerable points in current methods are the absence of fundamental principles, the non-requirement of hearing on the part of students, and the separation of theory from practice.

Students, or in other words, singers and players, are forever studying the *how* and rarely if ever know anything about the *what*, and must be content with the *why* because the teacher says so. Now, if a singer and player does not have a perfect conception of the *what*, which is the exact musical effect he desires to realize, he can never appreciate the logic of the *how* and of the *why* of practice. His mind is not trained in forming clear conceptions of musical effects. As the *what* represents the desired effect and the *how* represents the immediate cause of the effect, it is obvious that the average student, who studies causes apart from a clear idea of effects, is practicing to no definite purpose, for he is causing nothing definite and is therefore practicing *nothing*. How much precious time is wasted over this very *nothing*, every sound musician knows and every layman can observe. In another paper I have elaborated this subject and demonstrated that the larger proportion of the difficulties that attend musical acquisition are the direct outgrowths of erroneous and, frequently, erratic methods.

There is a still more effectual evil than that that emanates from faulty methods, an evil that goes far in accounting for what is generally considered a necessary divorce of theory from practice in such methods. I refer to the Tonal System and our conception of it. For a foundation to build on, the scale is too complex a unit: its combinations and incidents are too multiple for any average beginner to grasp as a whole, and unless this can be done it is not comprehended. To do this is a psychological impossibility. The student must have something less complex and something within his mental grasp to set out with. This desideratum is furnished by my view of the Tonal System, which demonstrates that there is something back of the scale at the foundation of music, namely, the scale-half and the Septonate. Every child can grasp a scale-half as a whole. Because of the practical value of my System, which has been amply proved during the past fourteen years, I

have every reason to lay great stress on the necessity and practicality of a higher standard of teaching as suggested above. If the standard of educators can be thus elevated, the natural law of demand and supply will of itself regulate, in due time, a proper distribution of music in society at large.

Mention has been made of the precocity of the musical faculties in children. A brief analysis of these musical faculties will show how much nature does for the individual, it will point out where education ought to begin and, to a certain extent, how education should be conducted, and it will emphasize what education, on a basis of discrimination, ought to accomplish.

Rhythm is the beginning of all life; it is the first chapter in a musical life and in the evolution of music itself. All internal and external movements in body and mind are manifestations of the rhythmical principle within us. The regular rhythms of music are powerful agents in accelerating and retarding the heart's action, and it is both reasonable and highly probable that at some future day rhythmopathy will become a common method of treating nervous diseases.

The universal law of rhythm is that harmony in motion by which equilibrium is maintained. Thus we, individually, maintain the equilibrium of the body in all our movements by certain regular accentuations, and in an analysis of these accentuations we may find a simple definition of rhythm as follows:

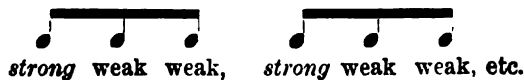
A rhythm arises when stronger and weaker accents are so alternated that the stronger accents recur at regular intervals. We feel, comprehend and enjoy rhythms when we anticipate these regularly recurring accents.

Every child can produce the fundamental rhythms of music, in the following exercises, with intelligence and alacrity; in these exercises the words regulate the discharges of muscular energy, and rhythm is acutely felt both physically and mentally.

Dual Rhythm.



Triple Rhythm.



Out of several hundred pupils, who had studied from five to twenty

years before coming to me, and many of whom had received the best of instruction at both American and European centers, there was not one that had ever learned the simple relation of accent to rhythm. The above simple scheme has proved an immediate remedy in every case for so-called bad time, and it is almost incredible that this evil should be so common when we consider how strong the rhythmical habit is within us. Such a state of things speaks ill of methods of instruction.

There is a wide gulf between a physical sense of rhythm, which is sensation, and a mental sense of rhythm, which is discrimination. However, the latter is the direct offspring of the former. The former is innate, and alike the possession of the barbarian, the musically uncultured, and the musically cultured; the latter is the possession of the musically cultured only. The same is true of tone-sensation and tone-discrimination, with this exception, that the savage has no sense of tone. The further we descend the scale of musical taste, the more pronounced the sense of rhythm becomes, and the more the sense of tone drops off and finally vanishes in the savage, as demonstrated by his crude instruments and his accompaniments to dances and yells. The deaf are known to enjoy music for rhythm's sake, receiving their impressions through sight and touch. Isolated cases are known, in which individuals who are deaf, blind, and mute enjoy the rhythm of music through the sense of touch, and Laura Bridgman, whose only sense was that of touch, enjoyed music intensely. Personally I have met individuals who, though not deaf in the ordinary sense of the word, are deaf to the enjoyment of tones and harmonies, but who listen to music for the pleasure they derive from rhythm. I know one such person to be a frequent visitor at concerts. Goethe, who must have possessed a strong sense of rhythm, failed in his attempts to become a musician, and as he had no ear for music he was unable to tune his violoncello himself, while in his preference of Reichardt's tone-settings of his poems to Schubert's, he showed his great lack of musical discrimination.

Paradoxical though it may appear on first thought, our vast musical public, composed of students and listeners, and also a large part of the profession, are musically indiscriminate. Music is generally studied, and a great fondness for music is evinced by that smaller fraction of society that represents our highest intelligence and refinement. While this cultured class derives its highest enjoyments in all other arts and sciences through an appreciation that is directly evolved from intelligent discrimination, its enjoyment of

music is on a plane with the lower senses and is therefore physical and sensual. Indeed, it is astonishing that the intelligent can stoop to spend their valuable time, and so much of it, in so indiscriminate, I may say, in so barbarous a manner, for as soon as his enjoyments are purely sensuous, the intelligent individual falls to the level of the uncivilized savage. To be sure, this intelligent representative of society has a way of translating the sensations and emotions with which music moves his spirit, into all sorts of language expressive of pleasures and pains, and therefore into all sorts of associated ideas—however, all this must not be mistaken for musical intelligence, as it so commonly is. This language tends to run into a transcendental style of expression, inasmuch as the complex emotions to which music gives rise are untranslatable and irreproducible in words, to which fact a large and unhealthy musical literature bears witness. Yet the musical public finds an outlet for the expression of its art pleasures and pains, in the habitual and terse form of *like it* and *don't like it*, behind which there always lurks a conviction and therefore an imaginary criticism that it is good, or that it is bad. The public is as ready to pronounce its judicial *like it* or *don't like it* on the works of Bach, Beethoven and Wagner, as it is on the writings of a Strauss, an Offenbach, or a Sullivan. A refined taste can alone spring from judgment, and why sound judgment of things musical is so unusual in the public mind, and why, more so than in any other art, there is so little appreciation of and due regard for the authoritative judgment of a musician, are matters that are accounted for by the state of music as a science, the methods of education, and the absence of a fixed standard. Musicians can only agree on general principles, therefore we must be somewhat lenient with the public, especially when we take into consideration the fact that musicians themselves are at loggerheads, finding it extremely difficult to come to any sort of a mutual agreement on even simple problems, a fact which alone suffices to condemn the present state of music-science.

Enough has been said here on the subject of our innate sense of rhythm to demonstrate that nature furnishes the individual with a most substantial foundation upon which to cultivate exact discrimination, and it follows that it should be an easy matter to develop such discrimination with proper methods. That every student should learn to discriminate any rhythm orally is, or at least should be, a matter of course. The reader who may object that the average student can do all this, will change his mind upon a little experi-

mental investigation. In the chapter on the Principle of Progression illustrations of the rhythmical law will be given.

Rhythm and harmony are inherent in every melody, or conversely, there is no such thing as melody or any musical thought apart from rhythm and harmony. Each member of this musical trinity is so intimately and inseverably related to the other two that no positive solution of musical problems can result from the separate treatment of any one member: manifestly it is highly important that their correlations should be investigated. As this subject will be considered at length further on, a few statements will suffice at this juncture. Melody, rhythm, and harmony arise in the mind as soon as we think or relation a series of tones, and the resulting phrase may be appropriately called a melo-rhythmo-harmonic phrase. I have stated that rhythmical equilibrium is maintained when a series of tones is arranged in groups with regularly recurring accents. Briefly, the rhythmical balance is maintained by accents. Now, there is an intimate relationship between these accents and the harmony that is inherent in the series. We shall see later that these *rhythmical accents determine harmony*. These accents are therefore directly implicated in modulation. Every tone in such a series, and this means every tone in music, is either an harmonic or a by-tone (Neben-Ton). Harmonics, or parts of chords, produce a sense of repose in the mind, while by-tones produce a sense of progression. Consonances preserve the balance, dissonances disturb the balance.

These brief statements are made in order to point out what nature does for the individual in this particular connection. Everybody knows that any average musical child can discern consonances and dissonances. I have never yet found a musical child that did not readily and intelligently learn the relations of accent to harmony and modulation, and that could not intuitively discern harmonics and by-tones. Thus here, too, nature provides a foundation upon which it is an easy matter for a higher musical education to build. Training in rhythm and harmony must go on hand in hand, and how high a degree of mental automatism is requisite to exact discrimination will be pointed out presently. As such discrimination is possible only when developed in accord with fundamental principles, and as discrimination is a necessity if the enjoyment and comprehension of music is to be elevated from its present basis of sensuousness and sickly emotionality to a strong and healthy intelligence commensurate with the standard of intel-

ligence in society, it makes no difference whether discrimination in music is a simple or a complex mental process and acquisition, it should be the basis on which to teach and study and the standard by which to sound musicianship. The case is mildly stated, when I say that it is unfortunate that there are so many teachers engaged in the preservation in society of an ignorance of its musical ignorance and who are forever decrying the low musical tastes for which they, in the main, are responsible. For who is to raise the standard of general musical intelligence if it is not the musical educator himself? These relations of the musician and the public are illustrated by a father who, in ignorance of his own responsibility, told a friend that his boys were the worst boys in the city. If the general musical taste is the "worst" musical taste, then let the educator improve it. It has been suggested that as years pass by there is a slow and steady increase in the demand for a higher class of music and for the best work of the best teachers and artists. But this slow improvement in the demand may be immeasurably accelerated by more rational, logical and direct methods, and by the exercise of better judgment in the management of musical institutions: therefore, by a more judicious expenditure of the enormous amount of energy and money that are wasted annually in every community of any size. In their derision, bitter criticisms and groans over the public taste, and especially over charlatanism and dilettantism in the profession, the musician and musical *littérateur* are rendered blind to the only simple remedy. How are we to rid ourselves of the charlatan and dilettante? I reply: through the public; for as soon as the public will not support them, just so soon will they cease to flourish. Travel on the road to reform is very slow and full of obstacles, but every obstacle that is overcome is a step ahead toward a higher intelligence, or in Emerson's words, "Difficulties develop brain-matter." The nervous, ardent, impulsive, and impatient musician is bound to conform to this natural law, and if he will do this in the proper spirit, by educating his pupils with the utmost care, his good influence will leave its mark behind him.

We may now turn our attention to that much-abused organ, the musical ear.

A number of successful experiments on children who had no ear for music and who, as a class, are condemned by teachers as unteachable, have led me to conclude that there is no such thing as an uncultivable ear for music, so long as there is no structural defect

in the organ. The methods by which I cultivated musical ears in such apparently impossible cases are explained at length elsewhere. Although each individual case required treatment in accordance with its particular nature, the ground-principles of my method apply to all cases. A rough sketch may be given here of my training of a boy of ten years, whose case was the most difficult of all, inasmuch as the boy heard no difference in pitch within the limits of two and one-half octaves; he could not tell a discord from a consonance, in a word, he was deaf to tones, and this lack of tone-sense showed itself in his speaking voice, which was coarse and monotonous. Again, his sense of rhythm was crude and his movements and general carriage were awkward and angular. I found that not a member of the family of eight to which he belonged could tell him whether or not his voice was in unison with his piano. I trained his rhythmical sense and tone-sense at each lesson, and saw him twice a week. How I trained his rhythmical sense need not detain us here, as the above definition of rhythm and the exercises in dual and triple rhythm will sufficiently indicate the course taken in this part of the procedure. My first step in training his tone-sense was to teach him to listen to my utterances for the purpose of imitating them in his own voice. To this end it was necessary to select such sounds as were within his daily mental experience, and musical tones were not. Therefore I began with speech by uttering such monosyllables as *ho*, *ha*, *hey*, etc., which he endeavored to mimic. These monosyllables were spoken, not sung, and spoken shortly and almost harshly, within easy reach of his voice. When this stage was overcome, I pitched short musical tones on monosyllables, to which I added a *t* or *p*, in order that the tone could be more easily terminated. Of course only one short tone was taken at a time and all tones were kept within easy reach of my pupil's voice. The next stage was to select words of two syllables, with a different tone for each syllable; the two tones were kept short, and melodious intervals were selected. During this stage single tones were prolonged by prolonging vowel-sounds, this being the essential difference between song and speech, as in speech the vowel-sound or tone is cut short. Here my pupil learned the difference, or rather the analogy, between a musical tone and a spoken sound. During this same stage I also required him to pitch tones that I played on the piano, no auxiliary musical instrument having been used in all preceding exercises; this he accomplished readily. After this, short snatches of melodies and then simple popular airs were taken up,

subjects which ostensibly appear under the banner of science, and in which we search in vain for a single scientific principle. In society we want a higher musical intelligence, a more rational discrimination of the comparative merits of music, musicians, teaching, and performances; the requirement of more common sense in the music-lesson; a more judicious distribution of the best means for popular education at schools, at churches, in the home-circle and drawing-room, at concerts, at the opera, and at the public parks; we want better musical morals, a thorough expurgation of vanity, hypocrisy, and undue flattery, which are so common everywhere. Among musicians we want more sound judgment and less volatile opinion. A higher musical education can alone minister to a gradual realization of such ends.

Music is a language; it should be taught and studied as such: we listen to it, hear it, think it, speak or interpret it, read it, and write it. Such minds as Bach, Beethoven, Schumann, and Wagner bear the stamp of great and glorious intelligence. The creative power in music is the intellectual power, and all musical works are records of different degrees of this power. Musicians at large, be they composers, teachers, interpreters, or *littérateurs*, are divisible into two classes, namely, those who understand the language and those who do not. The work and expression of the former are sincere, ardent, and spontaneous; of the latter, mechanical and labored. The former may be called concrete musicians, the latter abstract musicians. We cannot be concrete musicians unless we can hear. However erudite the abstract musician may be, he cannot assimilate his knowledge or put it into valuable practice, or make a lasting impression on his pupils, for he lacks the essential foundation, and is not, in the strict sense of the term, a musician. He hears only because he has ears and cannot help it; he does not to-day recognize the composition he heard yesterday, because he has no programme to consult, and he therefore hears only by sight; and in order to find out how a certain interval or chord sounds he is compelled to go to a piano or to an organ for the desired information.

I have said that our methods of instruction are indirect. This will become more obvious when we consider some of their most vulnerable faults. These methods tend to make students abstract and mechanical musicians rather than concrete musicians. Students learn so much about notes and signs and so little about tones and their language; so much about the *way* to sing and play, so little about *what* they are singing and playing; the eye is directly

cultivated, while the ear is left to absorb what it can. The ideas of composers lie concealed in notes and signs, but he who can translate this vehicle into the language of tones and into a subjective experience pure and vivid, is alone destined to discover the idea. However, this cannot be discovered accidentally or intuitively, as is generally imagined; it is entirely a matter of intelligent discrimination. The gates are open to all who journey on the right road and journey far enough, for in music as in other studies it is a question as to how far you go.

The simplest one-voiced musical phrase combines melody, harmony, rhythm, and meter, and we cannot comprehend such a phrase unless mental habits have been cultivated to meet these melodic, harmonic, rhythmical, and metrical conditions as fast as they impinge on the mind's ear. A scrap of musical thought is never less than a section, or small phrase, and less than such a small phrase conveys no musical sense to either adult or child. During many years of observation, I have found that nature and the stimulating influences of a more or less favorable environment educate the faculties of every-day musical children to a common result. Highly-gifted children and so-called prodigies are here excluded. The common result referred to is an intuitive sense of a musical period, of its melodic, harmonic, rhythmical, and metrical conditions. This is proved by many facts, one being that little children often improvise little airs of their own which, in many instances, are perfect in form and detail, and of which I have made an interesting collection. What this signifies, and that it signifies much, further analysis will show. It signifies a sense of the most intimate relationships of tones in a key and scale, a sense of rhythmical and harmonic progression, a sense of simple dual and triple rhythm and measure, a sense of the small phrase, and a natural predilection to tone-think and tone-produce. This precocity in the natural musical faculties of children explains why our methods are indirect, leaving so much to intuition, and why so much is accomplished in so illogical and unwarrantable a manner, for there are fine singers and players everywhere. Fine musicians are, however, not so common, and therefore the psychologist reads something still deeper and more important in these bountiful gifts of nature, namely, the ease with which direct methods might be employed and the great improvement in all things musical that would follow. Nature provides so rich a soil in the child for the educator; therefore, let education begin where nature leaves off, let the educator begin by

taking gratefully what nature has given and let him intellectualize the natural instincts of his pupil.

By method, I mean that method that is based on natural laws, and therefore on fundamental principles; that aims at the development of discrimination, and of the concrete musician; that method, whose first step is to diagnose a pupil; whose advance steps progress gradually from the simple to the more and more complex, each step of which considers the individuality of the pupil, embodies a definite purpose and a good reason, and is indispensable to a realization of the desired end; each step being selected to meet the individual needs of the pupil, it is imperative that the pupil should clearly understand its exact purpose. Such is the direct method that we do not possess in music. For where is the method that compels the student to discriminate; that explains the reason why; that teaches how to listen and what to listen for, and that measures a student's progress by his actual attainments and practically tests every step before the next is taken; that explains and develops taste, conception, and expression on the basis of intelligence; that makes the pupil feel responsible for the expression with which he invests every tone, and requires the expression of a musical idea to spring from a mental experience of it; in short, a method that combines theory with practice by teaching the language of music itself? Our methods are despotic rather than logical; they command and do not give the reason why, and therefore fall far below the standard of methods in all other art-studies. There is no doubt that methods have been greatly improved in late years, but at present we are concerned with the faults of methods and not with their good points. Although much space might be given to a presentation of improved methods, none of these methods develop the student on a basis of intelligent hearing, and therefore all methods have this fundamental fault in common.

A student is laying a substantial foundation for a genuine appreciation of the language of music and is studying music, in the strict sense of the term, when he is exercising his mind in thinking and observing the relations of tones, for the purpose of learning their agreements and antagonisms, their relation to a mutual Tonic and consequent groupings into keys and scales; the varieties of intervals, chords, rhythms, measures, meters and their differences; and all this mental practice, when properly guided, must evolve an accurate ear and intelligent feeling. Among the several hundred pupils already alluded to, there was not one that had ever heard or

thought of *thinking* tones and of mentally constructing phrases, of mentally leading voices and combining several voices in a series of chords; in short, that had ever heard of such mental practice and that ever knew that he, in common with all musical mankind, possessed an innate sense of the Tonic and its most intimate relationships. Under such circumstances it is not surprising that some intelligent pupils begin to feel almost ashamed of their natural predilection for music and argue that music must be the lowest art, even though Herbert Spencer says that music stands highest in the hierarchy of the arts.

In the familiar sense of the term, to study music means to learn to sing and play. The multifarious methods for these purposes present a labyrinth of mechanical details, precepts and practices relating to the use and mastery of some special instrument, and are often preluded by a wise discussion on the physiology of the particular organs of the body that come into play. My brief criticism of these methods may be repeated thus: the *how* is studied before the *what*. My remedy is equally brief, namely: let the *what* precede the *how*. In this way the ear will receive the attention that at present is almost exclusively directed to the eye. As it is, the average pianist *sees a note, sees a key, strikes it*, and last of all, *HEARS*. According to the above remedy the pianist first of all *hears* mentally *what* he wants and then sets about producing it in a rational manner. The *how*, of necessity, grows out of and is suggested by the *what*. The musician is represented in the *what*, the instrumentalist in the *how*. The two must be combined in one individual. There is a far more important instrument than the voice, piano, organ or violin, whose technique must be developed to a high degree of automatism. This instrument is the mind. The product of its proper exercise is the concrete musician. All conducting, playing and singing directly betray the quality of this product. The musician says *what*: the instrumentalist says *how*; the latter must respond spontaneously to the behests of the former, the union of the two must be perfect. That the most difficult part of the battle of the *how* is won by a clear and comprehensive conception of the *what* is self-evident. That the larger proportion of the difficulties which attend the *how* do not exist apart from the erroneous methods which generate them, and that an incalculable amount of time, energy and money are uselessly wasted in the study of music, are matters which I have proved in practice and shall demonstrate in another paper. Yet the high degree of mental

automatism which is requisite to a correct reader and interpreter of music is frightfully complex. All the more reason, then, why an intelligent exercise of the mental instrument should be begun as early as possible. That the performer should be a musician and that the musician should be far in advance of the performer, are matters of course; but this state of things is unusual, inasmuch as the ambition to execute far exceeds the ambition to attain to sound musicianship. The great advantages of studying music in connection with an instrument, especially with the piano, are not for a moment taken into question. It is, however, an error to suppose, as many do, that learning to play on some instrument is absolutely indispensable to the study of music: for the mental instrument can be cultivated to an unlimited degree in a person who is neither a singer nor a player. It would be a good thing if piano-players were compelled to study without a piano for a few weeks at a time, and if between times they were compelled to keep away from their pianos until they know exactly *what* and *how* they are to practice. Such restrictions would give pianists the much-needed opportunity for exercising their musical faculties and would ultimately elevate their general standard of musicianship, which at present is too often on a plane with the rope-dancer, the acrobat, and the juggler. The ready-made tone of the piano is a serious though not an insurmountable obstacle to the development of the mental instrument of the pianist. By the employment of logical methods, the piano is best suited as an auxiliary to a higher musical education. As regards the singer, were he compelled to depend upon his own mind for his tones in practicing his exercises, and on a tuning fork as his only auxiliary instrument, instead of depending, as he commonly does, on the ever untrue piano for his pitch-information, there would be far less of that prevailing evil known as singing out of tune. In musical expression the feelings tend in a certain direction, and we follow on the line of least resistance. There is no question as to what the motor in musical expression should be. Everybody will say it should be a refined intelligence. Every true musician knows that coarse animal feeling too commonly passes for such intelligence. The same intelligent society that complacently accepts the coarsest sort of ranting in music would not tolerate anything so crude and revolting in the recitation of a poem, or in the presentation of a drama. But what can be expected of the musical public when we take into consideration the fact that the ground-principles of music are not yet fully developed, and as a natural consequence, that

musicians often pronounce the most diverse opinions on many important questions relating to music science; that there are so many individuals that, by dint of loquacity, pass for musicians when they are not entitled to such a distinction, and that turn the art into a trade ; that there are so many methods that claim to accomplish the same ends in so many different ways; that such methods are in large proportion faulty at their foundation; that in the music-lesson theory and practice are taught and studied separately; that opinionating is the rule and judgment the exception, and therefore that a piece of music may be subject to a dozen different readings, conceptions and interpretations; in short, that there seem to be no standards for musicianship and for music interpretation. I do not think that the standard that has been furnished in these pages for the sounding of musicianship can be gainsaid. The standard of interpretation will receive some attention presently.

The more carefully I look into the relations of musician and public, the more I am inclined to take up weapons in defense of the latter. The unreasonableness of the demands of the musician on the public and the degree to which the musician takes advantage of the musical ignorance of the public, have no parallel. Such a statement calls for illustrations. To expect the general public to appreciate and enjoy a symphony, an oratorio or a cantata at one sitting, when it takes the executants weeks and months to get anything like an adequate idea of the work, is absurd, to say the least. Again, the prevarications so commonly indulged in by concert-pianists, such as changing the original text of the masters and interpolating cadenzas and the like, to suit their caprice and bad taste, and often to conceal an imperfect memory, are things that the public would not accept were the public aware of them. These illustrations might be multiplied indefinitely.

There are not a dozen right ways to read a piece of music. The prevailing notion, that one interpreter has as good a right as another to his reading, is logically wrong. A phrase of music cannot be changed without destroying the author's intention ; and a phrase cannot be concealed from the intelligent reader, for here it begins and there it ends. A perfect mental translation into tones of its melody, harmony and rhythm, with strict observance of the author's indication of its expression, must give the phrase its originally intended effect. A single phrase is but a fragment of a whole. By relationing the phrases that occur in a period and the periods that occur in a part, then again by relationing these parts, we are

prehension of what takes place from moment to moment is complete. Thus we understand perfectly when we anticipate perfectly. When the anticipation is imperfect, the reason is appealed to for an explanation of what has just taken place, while if we really do anticipate, there is no conscious intervention of the reason. All our enjoyments depend on such perfect anticipation. Anticipation in this sense is not only a fundamental psychological law, it is also that fundamental æsthetic law which teaches us that all violent shocks and surprises are in bad taste in all the arts. Although sudden surprises are often regarded as pleasurable, they are not, inasmuch as they only irritate and violently disturb the normal rhythm of the body and mind. Beethoven's works are free from such shocks, though in the hands of some interpreters they often irritate both mind and body. Impressions are effects, and effects are understood and enjoyed only when their immediate causes are known. Conversely, if an effect is not inseparably associated in our minds with its immediate cause, it is not comprehended. For example: Wagner may hide his orchestra from view, however, unless the auditor understands the effects which proceed from the strings, wood-wind, brass, etc., that is to say, unless these effects are associated in his mind with the appearance of the various instruments and with the appearance of the method in which they are played upon by the performers, he cannot comprehend them, and therefore cannot fully enjoy the music. In every-day life, we pay no attention to the multifarious familiar sounds that are continually beating upon our ears, because we know their immediate causes; however, as soon as an unfamiliar sound occurs in our environment, we ask ourselves, what is it? And this is asking, what caused it. The individual who is unfamiliar with the effects and appearances of orchestral instruments, as just described, is continually appealing to his reason for explanations, while listening to the invisible orchestra at Bayreuth. The musician who can appreciate and enjoy the music which issues from the hidden orchestra, can do so because he sees the orchestra in his mind's eye. Therefore, whether an orchestra is hidden from view or not, it cannot be hidden from the mind's eye of the musician.

What is of especial significance in considering the mental operations in music, is the fact that the moments during the progress of a piece of music are limited by the prescribed *tempo*. The current of the music runs onward and onward, there is no stopping until the end is reached, what passes is left to recollection and what comes is left to anticipation, there is no time to look back, everything must

be assimilated as fast as it comes, and the moments from tone to tone and from phrase to phrase pass by in rapid succession even when the *tempo* is moderate. Hence listening to music with discrimination furnishes an example of mental concentration without a parallel. The attention of the individual listener is so riveted to each tone and combination in the onward current of the music that, for the time being, all other ideas are excluded from consciousness. These facts, when considered conjointly with the musical gifts of nature, roughly account for the universal power and charm of our tone art. This powerful concentration of the attention while we are listening to music will be further explained when we begin to analyze our innate senses of harmony and rhythm, which senses are the common possession of all musical mankind. We have observed that tones attract and repel each other and thus cause us to lead voices in like, parallel, opposite and oblique directions, and therefore, by some natural law, voices gravitate and rise, meet and separate. These attracting and repelling forces are unknown to us apart from a subjective experience of their effects. Through our harmonic sense we perceive these antagonisms and agreements of tones, and our harmonic habit is such that we are irresistibly impelled to lead a voice or several voices on the line of least resistance. This line of least resistance makes for points of repose or harmonics and we intuitively lead all progressing voices from dissonances into consonances. Dissonances and consonances must, however, not be mistaken for causes; they are effects. We shall see in later chapters that the natural ear for music is habituated to the *line of least resistance*, and that this innate habit is what our text-books on Harmony incongruously call *strict voice-leading*. The fact that by nature we so keenly feel the progressions from by-tones to harmonics and so acutely anticipate the resolutions of dissonances into consonances accounts, in part, for the expressiveness of music and for its power to concentrate our attention. This power is further accounted for by our natural rhythmical habit, which has already been explained, as a natural inclination to arrange tones into regular groups by accentuating the initial tone of each group, thus preserving the equilibrium in progression. For these reasons, in the main, the mind of the listener to music is forced to attend closely to what takes place from moment to moment, and is bound to progress along with the music from tone to tone and from accent to accent.

There is no other art in which the moments of cognition are so limited, and this is due chiefly to the given *tempo*, which gives us no

time to stop to think. Painting, architecture and sculpture drop out entirely in this connection, for we may contemplate the masterpieces in these arts *ad libitum*. Though these moments are limited in the drama, they are not limited by any prescribed *tempo* like music. Therefore, a highly developed discrimination of music must be regarded as a manifestation of alertness of mind and concentrative power without parallel. Another result of psychological analysis may be added here for the instruction of those who find it difficult to discover any relation between mind and music, namely, that the master-works of a Beethoven and a Wagner, as set forth in their full scores, represent in point of acumen, comprehensiveness of conception, fullness of content and complexity of detail, the highest achievements of the human mind.

Though many important points in connection with the subject of musical education have been entirely omitted, while others have been little more than touched upon in the preceding pages, I have sufficiently urged the necessity for more direct, more rational and more rigorous methods in musical instruction. When a high standard of musicianship is aimed at, the study of music will ever remain a difficult undertaking. The ambition of the average student of music is to become a famous singer or player, and this means to wrangle with fellow-executants for the largest applause that can be elicited from an indiscriminating public. This place before the public is an important one to fill, but the average concertist must concede to his public or perform to empty houses. There are plenty to fill this place, who are best suited to it, and suited to nothing higher. It is greatly to be desired that a higher ambition, that of the musical educator and thinker, should become more common. The ephemeral applause of the public is too sweet for the average musician to resist, and therefore too few have the moral force to withdraw from its alluring stimulus into their studies for the purpose of devoting their energies to sober reflection and investigation, for the future good of the art and its lovers. It is to the thinker and educator, whose influence is most telling in elevating the intelligence of the musical public, that this introduction is addressed.

By employing what I consider direct and logical methods, I have demonstrated in my capacity as a teacher, that children may be intelligent musicians from the start. They can learn to hear and think tones and their combinations and successions, with discrimination. Their productions in song and on the piano can be as intelligent and in as good taste, and as artistic in their way, as are the produc-

tions of more complex music by maturer musicians. When trained on a basis of discrimination and furnished with tangible definitions, a child studies eagerly and learns readily. Without entering into any further details, it may be added that on this basis the mind of the child is quick to observe and quick to perceive, and, in short, such mental activity is healthful, and to a purpose. At an early stage children develop an inclination to produce their own musical ideas, or, in a word, to improvise, a valuable practice, which has almost become a lost art.

In conclusion, I may add that such results as just described are not alone due to simplified methods. The cultivation of exact hearing from the start, is made practicable only by the simplification of the Tonal System itself. This simplification of the Tonal System constitutes the subject matter of the ensuing chapters. The child requires a simpler foundation than the scale to begin on. The scale-half, or tetrachord, and the Septonate, supply this desideratum. It may be mentioned here that the Septonate is no theoretical fabrication, or figment of the imagination. The Septonate represents the seven principal tones of the key-group in their most intimate relations to a mutual and *central* Tonic, or keynote. This original position of the Tonic is heard in every musical thought and appears on every page of music. Besides simplifying the study of music the Septonate simplifies musical theory.

The content of this introduction may be thus summarized: A higher education in music is desirable, it is necessary, it is practicable.

THE SEPTONATE
AND THE
CENTRALIZATION OF THE TONAL SYSTEM.

CHAPTER I.

STATEMENT OF POSITION.

WHEN we undertake to shift the foundation of music from the scale to the Septonate and key-group, and introduce new principles and views, all music problems become involved and are placed in a new aspect. This shifting of the foundation of music and its consequences, both theoretical and practical, constitute the subject-matter of these chapters. The comprehensiveness of my subject makes it desirable at the outset to furnish the reader with as clear an idea of its nature and scope as possible. This course will necessitate some repetition. The plan that I have adopted is to devote the present chapter to a condensed statement of the more important of my views and conclusions, to arrange my topics in their proper consecutive order and to leave all elaborations for subsequent chapters, except in such cases where a statement cannot be made intelligible without some explanation.

Tones as we Think and Hear Them.

The word *note* is often erroneously employed in the sense of the word *tone*. "A sweet minor note" may be poetry, but it is not sense. Notes are simply signs.

The German word *klang** fully expresses what we hear in the compound of elementary or partial tones which collectively constitute a musical tone.

As in music a tone or a *klang* is thought, heard, and treated as a unit, the analysis of such a unit into its elementary parts does not concern us here. This much may be said, however: if the senses are to be trusted, we hear that the elementary tones in a *klang* *lie*

* Since our language contains no adequate equivalent for the German word *klang*, there is no reason why this word should not be introduced into our musical vocabulary with its original orthography, orthoëpy, and meaning. I shall use it in these pages in both its special and general sense.

both over and under a central tone or nucleus, and therefore not alone over a fundamental tone, as is generally believed.

The scale and the key-group represent a series of klangs which vary in their relative rate of vibration or pitch. Although we can hear faintly sounding elementary tones while thinking an isolated klang, such an isolated klang plays no part in music. For in music a klang is always thought and heard in connection with other klangs, and therefore always occurs in some positive relation which determines its exact pitch and gives it a definite musical character or meaning. A separate tone is a tone out of relation, and means nothing musically. *Music at all moments occurs in some one key;* every tonal incident is therefore a *key-incident*: hence the primal relation of a tone is its *key-relation*. Thus a tone has no definite character in the mind until it is relationed as a *key-klang*. The seven principal tones of the key-system, which are supposed to be represented as a unit by the scale, I call the seven principal *key-klangs*. We will return to the subject of key-klangs presently.

During the tension of a tone or klang in the mind we can easily discriminate its four inherent and therefore inseparable properties as being pitch, klang-color, intensity, and length.

At present we will consider tones in regard to their differences in pitch.

A tone is *individual* and *immutable*. This plain fact is verified by pitch, for the rate of vibration differs in every tone throughout the chromatic and enharmonic scales. Apart from its verification by physical science, the fact is conclusively proved by the ear. While thinking from tone to tone, whether we progress in whole-steps, in skips, or in *half-steps*, in every instance we progress from one individual and immutable tone to another individual and immutable tone.

Every tone is *individual*, because it occurs but once in the System; it occupies and holds a place of its own, and its place cannot be filled by any other tone; it is unlike any other tone in pitch; it is an indispensable component of the whole system, and its omission would leave the system incomplete.

For the same reasons every tone is *immutable*. Careful attention is called to this important fact, as it involves a revolution in the prevailing conception of the Tonal System in two particulars: first, it plainly demonstrates that a tone cannot be changed by the process commonly known as *raising* and *lowering* tones; second, it as plainly demonstrates that our musical alphabet of seven

letters is incomplete. There being more tones than letters within the limits of one octave, it is only reasonable that there should be as many letters as there are tones within such limits.

Our system of notation and our system of tones are at logger-heads, and unless we constantly bear in mind the distinction between a tone and its sign, confusion must arise. **Ex. 1.**



In this example, C is apparently raised and lowered, therefore changed into C#, Cx, and Cb. This change is, however, apparent only in the notes and letters. The *tone* C cannot be raised or lowered, in short, cannot be changed, for a change of pitch results in a progression from one tone to another. These four C's are four individual tones, and their exact pitch is determined by the relations in which they occur. Of course when a tone is pitched too high or too low, it is simply out of tune, but tones out of tune do not concern us here. The tones C#, Cx, Cb are as unlike C and as unlike each other as are the letters x, y, and z: call them x, y, and z, and it becomes plain that C cannot be changed into x, y, or z. As every tone has its own pitch, the changes a tone undergoes are changes in relation but not in pitch.

As every tone in music is individual and immutable, it follows that *every interval* and *every chord* is *individual* and *immutable*. This is equivalent to saying that such things as *inverted intervals*, *inverted chords*, and *changed* or *altered chords* do not exist. It is obvious that a complete eradication of *inversions* and *changed chords* from textbooks on Harmony will greatly simplify matters for students.

In another paper I have expressed myself on the shortcomings of our musical alphabet and have proposed a plan by which each tone within the limits of an octave shall be known by a separate letter: for as a tone is individual and cannot be changed, it stands to reason that each tone within the limits of one octave should have its own letter.

A tone cannot move. It is very common to speak and write of tones moving or progressing up and down. The impropriety of such phraseology becomes manifest, when we consider that tones differ in relative pitch, that the individual pitch of every tone determines its relative position to other tones, and that a change of pitch results in a progression from one tone to another. Therefore,

a tone and a chord cannot move up or down. What we mean is, that a voice or several voices move up or down ; just as a voice moves *from tone to tone*, so when we think from tone to tone we are leading the mental voice from one tone to another. So also in thinking a succession of chords, we are leading several voices simultaneously. The practical value to the student of harmony of this distinction between moving tones and moving voices cannot be overestimated by teachers. Yet it is so common and convenient to speak of tones moving that I often find myself committing the blunder.

The Sense of Harmony and the Sense of Rhythm.

While thinking a series of tones, we feel and hear that we are disposed to progress on certain tones and to stop on others. This is due to a certain force that tones exert on one another. In consonant relations, tones hold one another in equilibrium or harmony. In dissonant relations, tones are out of equilibrium and antagonize one another, and in such relations we are stimulated and irresistibly impelled to progress in whatever direction we are attracted or repelled.

Any series of tones that we may think takes form in the mind as a *prominent* voice. This prominent voice generates other voices which are heard faintly and which constitute its concomitant harmony. As such a prominent voice is the nucleus of a musical idea, and as the character of its concomitant harmony is conditioned by its own particular character, I will call it a *governing* voice. The moments of repose just alluded to are accounted for by the fact that at such moments tones accord or harmonize with the concomitant harmony, while the moments of progression are due to the fact that during such moments tones antagonize the concomitant harmony. Repose-tones, or parts of chords, I call harmonics ; progression tones, or tones that lie a step or half-step over and under an harmonic, I call by-tones (German, Nebentöne). Every tone in a musical work is either a by-tone or an harmonic.

Again, while thinking a series of tones, our rhythmical habit impels us to arrange them in groups, and we do this by accenting tones at regular intervals. These accents are most intimately concerned with the harmony of the series, and observation has led me to add a new principle to music. It is as follows :
ACCENT DETERMINES HARMONY.

The Principle of Progression.

This principle, as we have seen, is implicated in both harmony and rhythm. To progress in the direction toward which a tone is attracted is to follow *on the line of least resistance*. This line of least resistance depends on the nature of the governing voice, for a musical idea takes form as a governing voice with a concomitant harmony. The line of least resistance, from the standpoint of pure tonality, is however on the path of the tones of the scale and key-group, which for brevity's sake I call the *key-track*.

Progression on the key-track is commonly known as *pure* and *strict voice-leading*, the accomplishment of which is very difficult for the average student, the greatest difficulty being due to the multiplicity of rules and exceptions to rules which overwhelm and confuse every student. The Principle of Progression, as set forth in these pages, places the student on the key-track at once, and he leads his voices on the key-track as a *simple matter of course*. Thus the great desideratum, namely, pure voice-leading, is placed within easy reach of every music student, and the Principle of Progression in a single sweep forever removes all the above referred to rules and exceptions to rules. Every musician will understand to what great extent this simplifies the study of music. In the succeeding chapters, the requisite data for the verification of these facts will be given.

It is on the beaten key-track, on this line of least resistance, to which young and old are habituated by inheritance and environment, it is by the guidance of the Principle of Progression that we must investigate the exact nature of the fundamental relations of tones.

The Key and its Klings.

I have said that a tone or klang is nothing definite until it is relationed in a key, on the ground that every musical incident is thought and heard as a key-incident.

A tone is relationed in a key as soon as it is thought and heard in relation with a Tonic, which is the point of absolute repose. Tones thus relationed at once gain a definite character and become what I have already called KEY-KLINGS.

The group of tones which collectively constitute a key is united into a whole or unit by its Tonic, or point of absolute repose. The sense of repose that a Tonic produces in the mind is innate and acute in every average musical child.

The Tonic-klang is the governing klang in a key, and when we say that some one key presides at all moments in music, we mean that some one Tonic presides at all moments. The change from one Tonic to another, known as Modulation, shifts the point of repose and changes the relations of klangs. Any musical child can discriminate a modulation even in a series of single tones. This will be explained later. Obviously, the starting point of all tonal problems in music is the key, or in other words, the Tonic with the other key-klangs which combine in establishing a key.

The first problem is the key itself. The questions at present are as follows: What are the relative positions of a Tonic and the remaining key-klangs? and, How many klangs are there in a key?

These questions are generally believed to have been settled long ago. We shall see, however, that this is not the case.

The Position of a Tonic.

The Tonic is a CENTRAL tone or klang and the remaining key-klangs are *equally* distributed *over* and *under* it.

According to the prevailing conception of a scale, the Tonic appears as a lower extremity and all the remaining klangs lie over it. But this is incorrect, for a scale contains two Tonics, one at each extremity, and therefore the remaining key-klangs in a scale lie *between two Tonics*.

The Seven Principals.

The seven tones that answer to the seven letters of the musical alphabet I call the seven *principal* tones or klangs, or briefly, the *Seven Principals*.

It is generally accepted that the scale presents these seven principals in their original order of sequence. This error has attained to a venerable old age and will be difficult to eradicate.

The order of the seven principals in a scale is one thing, and the order of the seven principals in their most intimate relations to an individual Tonic is another thing.

The scale and its harmony usually make up the first lesson in musical theory and practice, and we have become habituated to the belief that they constitute the fundamental basis of music. These are errors of long standing. There is something still lower down and at the bottom of our tone structure, namely, the SEPTONATE with its two *tetrachords* or what for certain reasons I call SCALE-HALVES.

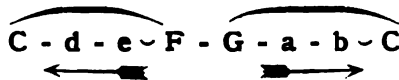
Definition of the word Septonate.

The word *Septonate* is derived from the three Latin words, *septem*, *tonus*, and *natura*. I found it necessary to coin this word in order to distinguish between the *seven* principal tones in their *natural* positions and the seven principal tones in their scale positions. The positions of the key-klangs in the Septonate will be established by the Principle of Progression in the two subsequent chapters.

The Septonate presents the seven principal key-klangs in their most intimate relations to a single or *individual* Tonic, which Tonic is a *central* tone. **Ex. 2.**

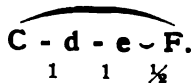


The scale presents seven principal key-klangs and one additional key-klang making *eight*, in their most intimate relations to *two* Tonics, one Tonic being a lower extremity and the other an upper extremity. **Ex. 3.**

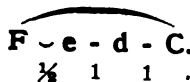


The Scale-half.

A scale-half or tetrachord contains four tones, and its steps are deeply furrowed in the mind. Start with a tone and rise, and we select the steps as follows: **Ex. 4.**



Start with a tone and fall, and we select these steps: **Ex. 5.**



These steps or progressions are on the line of least resistance or beaten key-track.

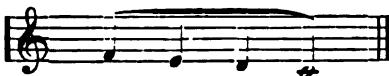
Which tone is the Tonic in **Ex. 4** and **Ex. 5**? In *rising* the *terminal* tone *F* is the Tonic. In *falling* the *terminal* tone *C* is the Tonic. Thus in both cases the terminal tone is a point of repose and unmistakably a Tonic. A scale-half is therefore both a *rising*

half and a *falling* half. The half that rises to its Tonic lies *under* its Tonic. The half that falls to its Tonic lies *over* its Tonic. Obviously then, a Tonic is approached both from above and from below.

Obviously again, the same *individual* tone is the terminal point and Tonic of a falling or over-half, and the terminal point and Tonic of a rising or under-half. The Tonic therefore lies at the center of the seven principals, and it follows that a Tonic is a **CENTRAL** tone.

The *individual* tone C is the Tonic in the following *over* scale-half.

Ex. 6.



The same individual tone C is the terminal point and Tonic in the following *under* scale-half. Ex. 7.



The Septonate and the Scale.

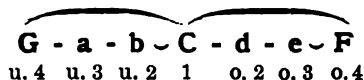
In the above examples, it is seen that a Tonic is the *common center* of two scale-halves.

A Septonate consists of two scale-halves with a single Tonic as common center. Ex. 8.



These are the seven principals in their natural positions.

As the Tonic is the common center of two scale-halves, I number the key-klangs as follows: Ex. 9.



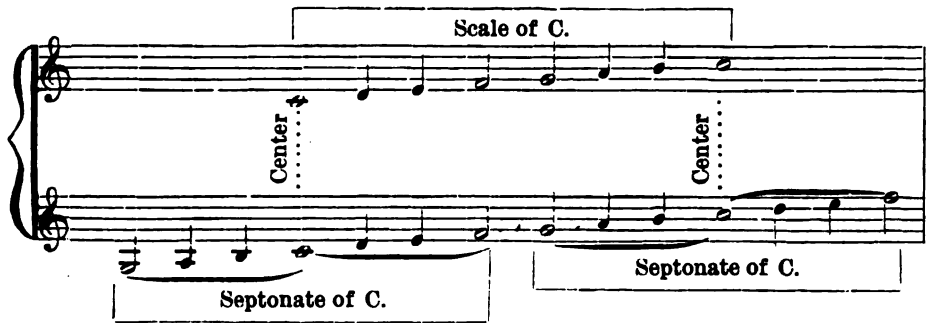
These letters and numbers indicate *central* 1, over 2, over 3, over 4 and under 2, under 3, and under 4.

Every higher and lower octave of a Tonic is the *center* of such a Septonate. Ex. 10.



The scale-half and the Septonate constitute the material for the first music lessons.

A scale is made up of two *contiguous* scale-halves, and its progress is from the *center* of one Septonate to the *center* of another Septonate. For clearness' sake, the following example of the scale is given with the two Septonates in which the scale occurs. **Ex. 11.**



The succession of steps in the two scale-halves is exactly the same. **Ex. 12.**

$$\begin{array}{c} \text{G} - \text{a} - \text{b} - \text{C} \\ 1 \quad 1 \quad \frac{1}{2} \\ \text{C} - \text{d} - \text{e} - \text{F} \end{array}$$

Combine the two scale-halves of a Septonate, and the voices approach one another and meet on a common Tonic which is the center of one Septonate.

Combine the two scale-halves of a scale, and the voices separate and move toward two opposite Tonics which are the centers of *two* contiguous Septonates. **Ex. 13.**



The above example shows that the two Dominants G and F coalesce in the chord known as the Dominant-Seventh chord. The Dominants occupy the poles of the Septonate and are equidistant from the central Tonic. The two Dominants are side by side in the scale and they are equidistant from their respective Tonics, but not from any one Tonic. The progression on the line of least resistance proves that in a Septonate the two Dominants face one another and their mutual Tonic, while in the scale the two Dominants do not

face one another, but face only their respective Tonics, which are the two extremities of the scale. **Ex. 14.**

The Septonate $G \rightleftarrows C \rightleftarrows F$

The Scale $C \rightleftarrows F - G \rightleftarrows C$

Although all of these matters will be further elucidated, I will stop here for a few illustrations in support of the fact that we think and hear a Tonic as a central tone.

When we relation a leading tone with a Tonic, we always move *up* a half-step into the Tonic. When we relation a Dominant-Seventh chord with a Tonic chord, we move from the seventh down a half-step into the third of the Tonic chord. Do not these two cases prove beyond any doubt that the normal position of a leading-tone is a half-step *under* a Tonic and that the normal position of the seventh of the Dominant-Seventh chord is a half-step *over* the third of the Tonic chord and therefore a fourth *over* the Tonic itself! Therefore I consider the leading-tone an under 2d and number the four tones in question according to their Septonal positions as follows: **Ex. 15.**



The exact position of a key-klang is determined by the direction it takes when relationing it with a Tonic.

Everyone must admit that the Septonal positions and numbers are in perfect harmony with the ear and the reason, while the scale positions and numbers are not. Compare the numbers with the klang and progression of the tones in the following examples: **Ex. 16.**

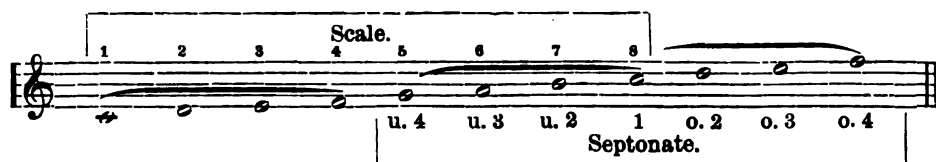
Scale Numbers.

Septonal Numbers.

The illogical connection and association of klangs with their scale-numbers and the plain logical association of klangs with their Septonal numbers will be still more apparent in the following few extracts from musical writings: **Ex. 17.**

Beethoven, Op. 111.*Beethoven: Symphony No. 5.**Schubert: Impromptu.**Schubert: Unfinished Symphony.*

It will be admitted that the scale-numbers 5, 6, and 7 are confusing when they are applied to the three tones immediately *under* a central Tonic. By comparing the scale and the Septonate, it is seen that 5, 6, 7, and 8 in the scale are always u. 4, u. 3, u. 2, and 1 in the Septonate: **Ex. 18.**



Thus in the key of C, the tones g, a, and b are always u. 4, u. 3, and u. 2 in every Septonate, high or low, and therefore their position in a Septonate is always *under* the Tonic. The scale and the Septonate must not be confounded. As a scale moves from the center of one Septonate to the center of another, and as the initial tone of a scale is numbered 1, it is plain that the remaining tones stand in a certain numerical relation to this number 1. Therefore the numbers o. 5, o. 6, o. 7, o. 8 are perfectly logical when applied to the *upper* half of the scale G - a - b - C, as these tones lie a 5th, 6th, 7th, and 8th, or octave, *over* the initial tone. If it is borne in mind that these numbers o. 5, o. 6, o. 7, and o. 8 are distinctively *scale* numbers and are always equivalent to the Septonal numbers u. 4, u. 3, u. 2, and central 1, no confusion can arise. The case is however different with g, a, and b, *under* the initial C of the scale. Thus far we have considered only the *over*-scale. There is an *under*-scale as well, and

the initial C in the above example is not only the center of the Septonate, but it is also the center of its *over* and *under* scales. Just as the over-scale rises from one Septonal center to the next higher Septonal center, so the under-scale falls from one Septonal center to the next lower Septonal center.

The *under*-scale lies under the central C, and its tones are found on the line of least resistance, as follows: **Ex. 19.**



The above numbers u. 2, u. 3, and u. 4 show a logical relation between klangs and numbers, and between the klangs b, a, and G, and the central Tonic over them.

At this point it will suffice to state that a complete scale is composed of an over-scale and an under-scale, and makes the circuit of two octaves and touches three Septonal centers. The complete scale of C is given below and each klang is given its proper scale number: **Ex. 20.**

Complete or Full Scale.




As a matter of course, the numbers in the over-scale are to be prefixed by the word *over* and those in the under-scale by the word *under*, viz.: o. 2, o. 3, etc., u. 2, u. 3, etc.

The complete and full scale presented above occurs in three Septonates. The over-scale moves from the center of a *central* Septonate to the center of a *higher* Septonate; the under-scale moves from the center of a *central* Septonate to the center of a *lower* Septonate.

A *tone* is an *harmonic center* and therefore the center of all its relations. In other words, a tone has as many related tones *under* it as it has *over* it.

Melodic incidents that cover as much ground as the following extract from Beethoven's Violin Concerto, are illustrations of the logical consistency of the above view regarding the relative positions of klangs both over and under a central Tonic.

The individual tone  is unmistakably the central

Tonic about which this Melody on the beaten key-track plays:
Ex. 21.



A Septonate presents the seven principal key-klangs as a PERFECT UNIT. A scale of seven tones is imperfect, as an eighth tone is wanting to terminate it. But there are but *seven principal key-klangs* in music and not eight. Therefore the Septonate is the true presentation of the seven principals. Therefore again, all theoretical and practical problems in music start with the Septonate and not with the scale.

The key-group.

A key-group contains *seventeen* tones. The seven principal key-klangs of a key-group are represented by a Septonate.

Besides these seven principals, a key-group contains what I call the *ten Primary Intermediates*.

On the ground that tones are individual and immutable, these primary intermediate tones belong to a key-system. Fuller explanation will be given later.

I divide these ten primary intermediates into two groups, each group containing five tones. Following is a key-group in the key of C:
Ex. 22.

{	<i>Seven Principals or Septonate.</i>				
	G - a - b - C - d - e - F				
	<i>Primary Intermediates.</i>				
	FIRST GROUP. UP-MEDIATES.				
	g#	a#	c#	d#	f#
	SECOND GROUP. DOWN-MEDIATES.				
	gb	ab	bb	db	eb

The first group of the primary intermediates I call *up*-mediates, because on the line of least resistance voices on these tones progress *up* a half-step. The tones of the 2d group I call *down*-mediates, because on the line of least resistance voices on these tones progress *down* a half-step.

The Tone-Stratum.

The center of a Septonate is the center not only of a key-group, but also of what I call a *Tone-STRATUM*. A Septonate and a key-group occur in a *single* stratum of tones. An over-scale and an under-scale move from the center of one stratum to the center of a higher and lower stratum respectively. The *complete* or *full* scale touches the centers of three contiguous strata. Thus higher and lower octaves of a tone, of a Septonate, and of a key-group occur in higher and lower strata.

The tones thus far specified do not complete the full number of tones that occur in a single tone-stratum. There are ten other tones in a stratum which I call the ten *Secondary Intermediates*. These I divide into two groups of five each, and they are as follows: **Ex. 23.**

FIRST GROUP.

g x b # c x e # f x

SECOND GROUP.

a b b b b b c b e b b f b

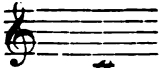
Thus a single tone-stratum contains twenty-seven tones in all, namely, the seven principals, the ten primary intermediates, and the ten secondary intermediates. When I speak of a *full* tone-stratum, it will be understood that these twenty-seven tones are referred to as a unit.

The small key-group and the large key-group.

The *small* key-group was explained above as consisting of seventeen tones and occurring in one stratum.

The *large* key-group is composed of three contiguous small key-groups and therefore occurs in three contiguous strata.

Centralization.

Middle C  is the CENTRAL tone of the System.

The natural key of C is the CENTRAL key of the System.

The Septonate with central C as Tonic is the CENTRAL Septonate of the System.

The full scale beginning on central C is the CENTRAL scale of the System.

The key-group with central C as Tonic is the **CENTRAL** key-group of the System.

The tone-stratum with central C at its center is the **CENTRAL** stratum of the System.

Centralization of Tonics and Keys.

Every key centers in and radiates from the central stratum. Thus the twenty-seven tones in the central stratum are twenty-seven Tonic-centers of twenty-seven keys.

The Tonic centers of all keys therefore lie in closest proximity and affinity.

The exact location of each Tonic-center is described according to its relative position over or under central C. Central C I call the *main* Tonic-center.

Thus all other Tonic-centers lie no further than a fourth above or a fourth below the main center.

As there are only twenty-seven Tonic-centers, there are only twenty-seven *keys* in music.

Many of these keys are not employed, owing to their complex notation.

Major and Minor Modes.

Every key has a *bright* or Major Mode and a *dark* or Minor Mode: thus *every key has two modes*. Each Tonic-center is the center of two such modes.

The key-klangs are united in a key-system by their harmonic relations to a central Tonic-klang. Both the major or bright Tonic-klang and mode and the minor or dark Tonic-klang and mode *occur in a single key-group*.

There is no such thing as an independent and "pure" *minor key*.

The Septonate and key-group, and not the scale, are at the foundation of music.

Major and Minor are the antiphonous modes of one and the same key. Thus C Major and C Minor are not *two distinct keys* but the *two modes of ONE KEY*.

Summary of the Tones Employed in Music.

The number of tones in music is limited.

A Septonate contains seven tones :

A key-group contains seventeen tones :

The over-scale and the under-scale contain eight tones each :

A full tone-stratum contains twenty-seven tones :

For all practical purposes the number of keys in music is limited.

In consideration of all this, it follows that the number of relations in which a tone may occur is limited, and the number of tone combinations is limited.

In other words, there are just so many steps, just so many intervals, and just so many chords, in music.

We may now begin our analysis with an explanation of the Principle of Progression.

CHAPTER II.

THE PRINCIPLE OF PROGRESSION, HARMONICALLY AND RHYTHMICALLY CONSIDERED.

I HAVE stated that both harmony and rhythm enter into our percept of progressions from tone to tone and from accent to accent. It now remains to verify this statement, by more fully elucidating what harmonic and rhythmical progressions are, and by furnishing a sufficient number of concrete illustrations of these phenomena. In this way the Principle of Progression may be established as a fundamental law in music, and its potent operation in the solution of practical and theoretical problems connected with the language of tones may be demonstrated. In view of the necessity of keeping this sketch within reasonable limits, an exhaustive survey of the present subject is out of the question. I shall therefore make such extracts from the more comprehensive work already alluded to and confine my remarks within such bounds as an adequate exposition of the Principle of Progression in its special relation to our subject will entail. Once proved that there is such a law in operation at the foundation of things tonal, it will not be difficult to establish as a fact that the Septonate, and not the scale, presents the seven principal sounds in music in their fundamental positions and most intimate relations, whereupon the centralized system of tones will follow as a natural consequent.

My plan is to consider separately the operations of the laws of harmony and rhythm in determining progressions and resolutions, as this will better prepare us to appreciate later on their remarkable coöperation.

Harmonic Progressions.

Let the reader think from tone to tone on successive steps and in skips, and carefully note what takes place. While representing such a series of tones, the reader will feel that on certain tones something forcibly impels him to move on to other tones; on certain

other tones he will feel with equal forcibleness that he has reached a point of repose and may stop. Why this irresistible impulse to progress and the concomitant sense of unrest in the first instance, and why this desire to stop and the concomitant sense of repose in the second? Now whether we will or not, we cannot think a series of tones, even in one voice, except in connection with some harmony; the variation of the harmony, or the change from one chord to another, is immediately determined by the variations in the cantus, theme, or melody, that we are thinking. In thinking such a series of tones in one voice, we are not necessarily conscious of this harmony; nevertheless the harmony is inherent in the series and therefore must exist in the mind. That this is the case with all musical individuals, whatever the degree of their musical endowments, whether they are children or adults, trained or untrained in the art of music, will be shown presently. Meanwhile let us endeavor to explain the two instances cited above.

In the first of these two cases, there is a disagreement and antagonism between the tone that the reader thinks and the harmony that he has in mind, and this disagreement is the cause that impels him to progress up or down to another tone; in the second case, there is an agreement or concord between the thought tone and the harmony that the reader has in mind, and this agreement causes the feeling of repose and the desire to stop. To state the case more plainly, in the first instance the antagonism that gives rise to a sense of progression is due to the fact that the thought tone is *not* a component part of the harmony in mind; in the second instance the agreement that gives rise to a sense of repose is due to the fact that the thought tone *is* a component part of the harmony in mind.

Tones are therefore divisible into two kinds, namely, progression-tones and repose-tones. Progression or antagonizing tones have already been called *BY-TONES*.* Repose or agreeing tones are harmonics, or component parts of chords. Hence every tone in music is either a by-tone or an harmonic.

My reader may exclaim, "in thinking a series of tones in one voice I can represent any harmony I choose, and what I represent as an harmonic another person may represent as a by-tone, and *vice versa*, therefore of what theoretical or practical value is the Principle of Progression?" To such objections I reply: certainly two persons thinking the same series of tones may represent any har-

*I use the word by-tone in preference to the terms "*accessory tone*" or "*neighboring tone*," on account of brevity and fitness.

mony they choose, and consequently their individual distribution of harmonics and by-tones would be entirely unlike one another, and therefore the same tone that one person represents as an harmonic another person might represent as a by-tone, and *vice versa*. However, this is not my point. I claim that if any number of musicians were to represent the same series of tones in exactly the *same* harmonic relations, their distribution of harmonics and by-tones would be identically the same. The importance of this fact as a guide to the establishment of the natural setting of the seven principal tones that make up the musical alphabet is obvious, for these seven principals are united into a whole by a mutual Tonic, and therefore, in seeking to fix the exact relative positions of the other six principals to a mutual Tonic, we are compelled to think identically the *same* tone-relationships and therefore the *same* harmony. The fact that these tone-relationships are innate, and therefore that we all think and hear them alike, plainly shows that musicians cannot disagree as to what the position of a Tonic is and as to whether the remaining six principals all lie over the Tonic, or both over and under it. So long as all musicians are by nature habituated to think and hear these relationships in the same way, then analysis as just suggested must lead to a common result.

What particularly concerns us just now are the facts that we all hear tones as harmonics or by-tones ; that in thinking a series of tones in one voice, whether we consciously represent a certain harmony or not, we nevertheless have some certain harmony in mind and are under its influence for the time being. In a piece of music the composer gives the harmony, and where he does not give it, it is suggested by the one-voiced phrase ; therefore in reading or listening to a piece of music, there are few chances for a number of musicians to differ in their distribution of harmonics and by-tones ; this will become still more obvious when we consider rhythmical progressions and the relations of rhythmical accents to harmony.

I repeat that every tone in music is either an harmonic or a by-tone ; that through a common innate sense of harmony, whether this sense is artificially educated or not, we are alone enabled to intuit and discriminate the agreements and disagreements of tones, and therefore that our sense of tone-progression and tone-repose is directly due to our harmonic sense. Conversely, in the absence of this sense, we would be unable to intuit and discern a dissonance from a consonance, a by-tone from an harmonic, a progression from a resolution.

For the sake of clearness, let us briefly review our analysis of harmonics and by-tones.

On a by-tone we feel out of harmony, out of balance, and hence our desire to move on and to recover harmony, or balance.

On an harmonic we feel in harmony, in balance, and hence our sense of repose and satisfaction.

On an harmonic succeeding a by-tone we feel that balance has been recovered, hence in musical parlance, our sense of resolution.

On a by-tone succeeding an harmonic we feel that balance has been lost, hence our irresistible desire to return whence we came or to progress to another harmonic, or point of repose.

While on a by-tone, what is it that so forcibly draws us up or down into an harmonic if it is not our perception of an entire chord of which the anticipated harmonic is a component part! The harmonic exists in the mind simultaneously with the by-tone; were this not the case, the harmonic would not be anticipated and, moreover, we would feel no desire to progress.

The terms *in balance* and *out of balance*, in reference to harmonic resolutions and progressions, though they may be objected to, have proved most serviceable in practice, as they exactly express the sensations that harmonics and by-tones produce. When we proceed to treat rhythmical progressions, the use of these terms will seem still more justifiable. The law of equilibrium is as applicable to mental states as it is to physical states, and in states of embarrassment and hesitation our minds are for the time being out of balance, and such a state of mind expresses itself by throwing the body out of balance. It is obvious that tones exert a force on one another, and this force results either in producing or arresting motion. We all hear and feel this force, and therefore the law of equilibrium operates in music, and the above terms are perfectly proper.

Before proceeding to the subject of Rhythm, we will stop for a few illustrations in support of the claim that the musical sense is the sense of harmony, and that this sense is the common possession of all musical mankind, from little children to adults, be they instructed in music or not. A little reflection on the part of my reader will discover an abundance of such illustrations; the following one is very familiar. A number of persons that have no musical training whatever, and that do not know one note from another, are singing in duet, trio, quartette, and chorus; where do the altos, tenors, and basses find their different according tones if these tones do not exist in their minds! These natural singers hear the leading melody and

find their various according tones without difficulty, because they hear the natural harmony as well as the changes of harmony which the current of melody suggests. There is a natural selection of tones by each singer according to the nature of his or her individual voice, and it may be worth mentioning in this connection that those singers that supply the middle voices are the most musical. Almost any one can sing the air, but to sing a middle voice and fill out the harmony is quite another thing. Harmony by natural selection is always beautiful ; harmony by artificial selection is too often constrained and even ugly, especially in all re-settings of familiar and popular airs. Somehow the modern composer seems to prefer the artificial to the natural selection of harmony and this preference, which really amounts to a forced search for new harmonies, has robbed most modern compositions of that pure and flowing melody, which is as dear to the musician as it is to the layman.

Every average musical child possesses an acute sense for harmonic progressions and resolutions. I have experimented on such children for many years, and in every instance they have proved that they have a reliable perception of harmonics and by-tones. After teaching such a child how to listen and what to listen for, it readily discovers the difference between these progression-tones and repose-tones. This takes a few moments only. I then play a period of melody and the child at once analyzes the melody into by-tones and harmonics. This experiment is within everybody's reach : all that a child needs is a simple definition of what it means to listen and to hear, simple essentials which the average musical student does not acquire.

I have often been surprised at the readiness with which little children distinguish harmonics from by-tones ; of course their only guides in doing this are the opposite sensations of repose and progression which these tones produce. I have found the sense of progression and repose very acute in a few cases of children of two and three years of age, but these have been exceptionally endowed children. My little pupils of seven, eight, and nine years, and the older ones too for that matter, set out with the scale-half and learn to hear and produce the many variations of its four tones with surprising alacrity. They are taught to represent the four tones according to their numbers, 1, 2, 3, and 4, and are soon able to distinguish each tone and all its relations with the other three ; after this the full Septonate and then the scale is practiced with the same care and exactness. In the first place, they can hear harmonics and by-tones

without knowing a thing about harmony ; however in the above alluded to exercises, they gain a concrete acquaintance with dissonances and consonances, and therefore with harmony ; in other words, they soon learn which of the four tones harmonize and which do not. To every teacher it will become obvious to what great extent this analysis of all the music that a child sings and plays, simplifies study. They make an easy and lasting acquaintance with the principal skips from one harmonic to another, as well as with by-tones as simple by-tones, regular and irregular passing-tones, and changing-tones. Every scale and chord, every melodic progression, every *appoggiatura*, mordent, turn, and trill is analyzable into harmonics and by-tones. Apt as both young and older pupils are in such concrete analysis, the younger pupils are more susceptible and progress faster than the older ones. Older pupils are not so apt at first owing to previously contracted bad habits, which like all settled habits can rarely be completely eliminated. It is natural, however, that the older pupils, who have a number of years of musical study behind them, appreciate the value of the Principle of Progression, to which fact some of their remarks, which may be given here, will testify. "I have always felt these harmonics and by-tones but never understood them as I do now." "I have always tried to find something tangible and positive to guide me in music and have not found it till now." "I have always felt the need of something which I could not explain and have studied theoretical works and taken lessons in Harmony and did not get it: I have found what I wanted in the Principle of Progression." It would be an easy matter to multiply these remarks.

Another point may be mentioned here. Nothing is better calculated to awaken a lively mental activity and the power of observation in children than an early musical education on the exact plan, for the discrimination of tones and their relations and progressions involves close attention and observation, and every child delights in such musical exercise. The favorable effect of such exercise on the general mental habits of children, making them better students in nature, at home, and at school, has attracted the attention of many parents and their acknowledgments have been numerous.

The value of this principle of harmonic progression in intelligent musical expression is obvious. The singer who acutely perceives the harmonics and by-tones and therefore the progressions from tone to tone in every phrase must of necessity produce an

expression far more musical, true, and pure, than the average. I say true and pure, because much of the prevalent singing out of tune is due to an absolute non-perception of the relations of tones. Unless tone-relations are purely conceived and heard mentally, the singer will and does detonate and always misinterprets. The effect of this principle on the touch of the pianist, and especially on the *legato*-touch, has proved highly beneficial. It is also noteworthy that this analysis of music into harmonics and by-tones makes rapid and intelligent readers of music, it teaches them to resolve every kind of passage into its fundamental harmony, and they are always on the lookout for this fundamental harmony, and ultimately learn to grasp long passages in their entirety, all of which immeasurably aids them in grasping the composer's idea. Other practical illustrations will be given in connection with rhythmical progressions, to which subject we may now turn our attention.

Rhythmical Progressions.

While thinking through a series of tones, if we follow our natural inclination, which is to follow on the line of least resistance, our innate sense of rhythm will impel us to arrange and divide the series into regular groups, or briefly, into rhythms. While thus engaged, we will observe that we feel an irresistible impulse to give a stronger emphasis to one of two or to one of three tones, and in this way we divide the series into regular groups of two or three. Should we think an equally strong emphasis or accent on each tone in such a series, all rhythm would be destroyed; moreover, rhythmical mind and rhythmical body would rebel, and for the time being we would feel decidedly uncomfortable, as under such circumstances we are thrown out of balance both mentally and physically. However, just as soon as we return to regular groups and regularly recurring accents, a state of perfect mental and physical equilibrium is recovered.

Although all tones are accents of different degrees, I shall, for the sake of clearness, divide tones into strong or accented and weak or unaccented tones, of course with the understanding that the terms strong and weak are always used relatively. Again, though the term accent is a purely dynamical term, rhythmical accents and dynamical accents must not be confounded with one another, for they are two distinct varieties of accents and are just as distinct from one another as they are from melodic and harmonic accents.

Tone rhythms arise when accented and unaccented tones are so

alternated that the accented tones in a series recur at regular intervals. Conversely, unless there is such a regular alternation of stronger and weaker tones, unless the lapses of time from one accent to another are of equal length, unless accents occur with the same frequency, a rhythm cannot and does not arise.

Thus we comprehend a rhythm only when we feel the coming of an accent, or in other words, when we anticipate regularly recurring accents.

The onward and onward rhythmical motion in music is a progress from beat to beat, from measure to measure, from section to section, from phrase to phrase, and from period to period.

A regular progress from beat to beat, measure to measure, etc., would be impossible if we did not anticipate the recurrence of beat-accents, measure-accents, and so on.

Thus it becomes plain that rhythm is not alone concerned with the groups of tones on a beat and the groups of beats and beat-groups in measures, it is just as much concerned with the groups of measures in sections, of sections in phrases, and of phrases in periods. Therefore rhythms and rhythmical accents may be specified as follows :

1. *Beat-rhythms and beat-accents.*
2. *Measure-rhythms and measure-accents.*
3. *Section-rhythms and section-accents.*
4. *Phrase-rhythms and phrase-accents.*
5. *Period-rhythms and period-accents.*

A beat is the unit of a measure, and measures arise by compounding beats.

A measure is the unit of a section, and sections arise by compounding measures.

A section is the unit of a phrase, and phrases arise by compounding sections.

A phrase is the unit of a period, and periods arise by compounding phrases.

Recurring beat-accents produce beat-rhythm.

Recurring measure-accents produce measure-rhythm.

Recurring section-accents produce section-rhythm.

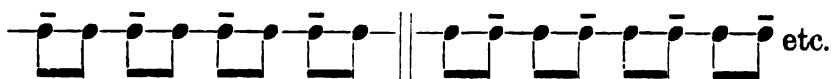
Recurring phrase-accents produce phrase-rhythm.

Recurring period-accents produce period-rhythm.

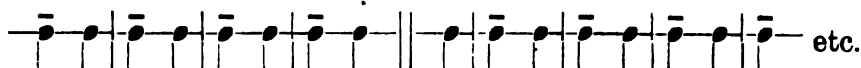
When one of two of any of the above units is accented, a

simple dual rhythm arises. When one of *three* of any of the above units is accented, a *simple triple* rhythm arises. These are the two fundamental rhythms in music, and all other forms are compounds and mixtures of these. Following are some examples of simple dual rhythm in which the accents are indicated by the sign $\bar{\cdot}$.
Ex. 24.

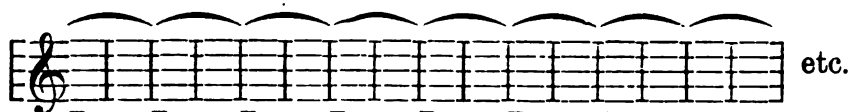
1. Beat-rhythm.



2. Measure-rhythm.



3. Section-rhythm.



4. Phrase-rhythm.



5. Period-rhythm.



Elsewhere I have furnished a full list of simple dual, simple triple, compound, mixed, regular and irregular rhythms, mono-rhythms and polyrhythms, and have further considered the employment of light and heavy rhythmical accents in the expression of music. Such a classified list need not be given here, as the above examples suffice for my present purpose, which is to examine more closely the exact nature of rhythmical accents and their relation to harmony, and this means their relation to tone-progression and tone-repose.

We cannot listen to, read, or interpret music intelligently unless we think in sections, phrases, and periods, and therefore unless the mind is under the influence of those more extended rhythms

and accents which I have specified as section-rhythms and accents, phrase-rhythms and accents, etc. The significance of these rhythms and accents will appear in the following illustrations. It is an interesting fact that when children and natural musicians of all ages, like full-fledged musicians, think, sing, or whistle a bit of music, this bit is never *less* than a section, and when they think a melody, they think from section to section or from phrase to phrase. This is so because less than a section has no musical meaning or content, less than a whole section contains nothing positive or complete in melody, in harmony, in rhythm, or in meter, while in an entire section there is a positive musical content, a complete part of a melody, and often a full musical subject or idea.

Indeed, this section-rhythm must be regarded as not only a musical but as a natural law, and it manifests itself in many ways. For example, in walking we emphasize one of every two steps, and the first of every four steps is emphasized the strongest. Now, this first of every four steps is analogous to a section-accent, for in singing or whistling to our walk our steps supply the measure of the tune, each step is a beat, the first of two steps is the measure-accent, and the first of four steps, which is most accentuated, is the section-accent. If our tune is in triple measure and the *tempo* is slow, each step is a beat, the first of three steps is accented and the first of six steps is the strong section-accent; if the *tempo* is fast each step is a measure-accent, and the first of two measure-accents is the stronger section-accent. When the measure and section rhythms are irregular we nevertheless accompany the initial tone of a section with a stronger accent.

I dwell on this subject at such length because it explains how impossible it is to think, hear, and express music intelligently or to get at or convey anything like a musical idea, unless we think and read at least in sections. Those pitiable piano-students (they are legion) who read from note to note, from beat to beat, and perchance from measure to measure, and who at best stammer confusedly through a piece of music even after they consider it mastered, will derive much help by learning to conform to this principle; they will play less and study and think more, and will not try to play, as they commonly do, before they have studied and thought, for when a student does not think he does not study, when he does not study he never discovers what the purpose of practice is, and not having a purpose, what object is there in his practicing!

The student will find an abundance of expressions and illustrations of the innate law of rhythm in his own individual mind and body and by observing others. The law of rhythm is a law of nature; transgress her laws, and nature uniformly and inexorably punishes. All stammering, hesitation, embarrassment, contortions of the bodily members and of the features, so common among piano-players, singers, and instrumentalists in general, are the immediate manifestations of such transgressions and the unmistakable evidence of the loss of both mental and physical equilibrium; they are due partly to individual bad habits, but more often they are the results of bad methods, and nature's methods are their only cure. Let all students learn to read sections, phrases, and sentences; this will enable them to grasp and express musical ideas and will lead to a natural rhythmical carriage; let students aim at grand expression rather than at grand execution, so that ultimately they may provoke the criticism "an admirable expression" rather than "an admirable execution."

Among English-speaking musicians the term *Time* is used in the sense of Time-measure (German: *Zeitmass, Takt*). To talk of $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ time is to talk nonsense; what is really meant is $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ measure, and therefore the term *measure* should always be used in this particular sense. The term *time* should be used exclusively in the sense of *tempo*. Thus *time* or *tempo* apply to rhythmical motion as a whole, and designate such motion as fast, moderate, and slow; as accelerating and retarding; as beginning and stopping.

Illustrations of the nature of an accent may be drawn by the hundreds from speech and bodily movements. A series of bodily movements is started by a discharge or accent of nervous energy, and when such discharges or accents are repeated at regular intervals there results a rhythmical movement. Accent in music is the same as accent in speech, both in the nature of its production or expression and in its effect.

The effect of an accent on the mind is on first observation only a stress or slight shock; however on close observation, its mechanical and dynamical principle is disclosed as follows: a greater stress involves a greater effort; a greater effort involves the collection of a greater amount of nervo-muscular energy in advance; this advance collecting of energy takes a moment's time; and finally, this moment's time is longer or shorter according as accents are

stronger or weaker. For brevity's sake, I shall hereafter call this moment's time during which we collect the necessary energy for an accent, a *wait*.

In my Introduction I roughly explained that our comprehension or understanding depends on our completely anticipating at one moment what will take place the next moment or in several moments to come. When such is not the case, there is an appeal to the reason to explain, and such an intervention of reason interrupts the understanding and the enjoyment. The moments during which we anticipate up and down tone-progressions are short as compared with the moments of our rhythmical anticipations. For example: in listening to unfamiliar music, when a resolution of a Seventh-chord has been consummated we can in no way determine with certainty what tones will follow, while rhythmically we do anticipate the completion of a section, phrase, and period. This not only demonstrates how impossible it is to understand music unless we understand its rhythms, but also that without a slight wait before an accent we cannot anticipate the sequence of rhythmical moments. In a word, this slight wait awakens the anticipation. For example: we hear a carpenter driving a nail, we do not see him; we hear the first short taps of the hammer which set the nail in its place, then longer and heavier strokes follow, and the length of the wait in advance of each stroke enables us to anticipate the degree of the shock which is to come: this illustration affords another interesting rhythmical point, namely, that a carpenter often gives a nail a few extra and entirely unnecessary taps with his hammer for no other reason than to gratify his nervo-muscular sense of rhythm.

The waits preceding accents in speech are very perceptible and very necessary in order to make speech intelligible, expressive, and impressive. The case is the same in music. The idea of an accent is inseparably associated with its mechanical production and the violation of the mechanical principle disturbs both mind and body.

In beat-rhythms the wait is almost imperceptible when beats are divided into many tones and the *tempo* is fast: but infinitesimally short as these waits are, they exist all the same. The longer the rhythms and the slower the *tempo*, the longer are the waits, and *vice versa*. Hence as a matter of course, the waits in measure, section, phrase, and period rhythms are respectively longer and longer and therefore more and more perceptible. The wait before the terminal tone or chord in any part of a piece of music is not only perceptible and effective, it is absolutely necessary, for with-

out it we have no perfect anticipation of a termination. The waits in advance of body-accents in marching and dancing are very perceptible and are indispensable to a natural rhythmical carriage and to the maintenance of the equilibrium.

Rhythmico-Harmonic Progressions.

Having treated harmonic and rhythmical progressions separately, we may now direct our attention to their coöperation.

I have already stated that any tone we may represent has of necessity some certain degree of intensity, or a dynamical value. Rhythmical accents and dynamical accents are most frequently coincident; but when they are not coincident the rhythmical accents are not destroyed however powerful the irregular dynamical accents may be, and therefore the measure and meter in a piece of music continue undisturbed. I mention this point in order that the rhythmical accents, which alone concern us here, shall not be mistaken for dynamical accents. In representing tones rhythmically we shall find that rhythmical accents and harmonics are very intimately related, it being an interesting fact that an *accented tone* always initiates or calls forth an ENTIRE HARMONY in the mind, while an unaccented tone does not.

Harmonics were described above as producing in mind and body a sense of repose, resolution, satisfaction, hence a sense of equilibrium or of the recovery of equilibrium. The effect of by-tones on the mind and body was described as the reverse, namely, a sense of progression or motion and of the loss of equilibrium.

Tone-equilibrium is lost when we stop on a by-tone, it is recovered when we progress from a by-tone to an harmonic, it is maintained when we progress from harmonic to harmonic.

Rhythmical equilibrium is lost when we stop on an unaccented tone, it is recovered when we progress from an unaccented to an accented tone, it is maintained when we progress from accent to accent.

Thus on certain tones in a series we are both harmonically and rhythmically *in* balance at the same moment, or both harmonically and rhythmically *out* of balance at the same moment; again, on certain tones in the same series we are harmonically in balance and rhythmically out of balance at the same moment, while on other tones in the same series we are harmonically out of and rhythmically in balance at the same moment.

I will now illustrate each of the above cases, and request the

reader to note carefully the intimate relations of accent and harmony already alluded to.

Represent a progression on two successive steps: the tone that is accented is an harmonic, the tone that is not accented is a by-tone:

Ex. 25.



In the above example the first tone is both harmonically and rhythmically in balance, while the second tone is both harmonically and rhythmically out of balance. *The first tone is the harmonic, the second is the by-tone, in consequence of the accent.*

Change the accent to the second tone and all is reversed. The first tone now becomes the by-tone and the second becomes the harmonic, as follows:

Ex. 26.



Continue the series by returning to the first tone and the case is not changed, that is to say, *the accent determines which of the tones is the harmonic.* **Ex. 27.**



If the two tones which we represent are both harmonics, the one that is accented is both harmonically and rhythmically in balance, while the unaccented tone is only rhythmically out of balance. **Ex. 28.**



In representing irregular passing-tones and changing-tones, the accent occurs on the by-tone, and the succeeding harmonic is therefore unaccented. The following illustrations of these two cases are strong supports to my claim that an *accent* calls forth the senso of harmony and *determines the harmony whether the accent occurs on an harmonic or on a by-tone.* **Ex. 29.**

Irregular Passing-Tones.



N. B.....

Ex. 30.

Changing-Tones.



N. B.....

At N. B. in the above examples it is obvious that repose and equanimity are felt only when accents and harmonics occur simultaneously, and that absolute repose is a coincidence of a rhythmical accent and a Tonic.

The student who does his practicing mentally should never have to hesitate while reproducing his musical thoughts on paper. The art of jotting down what passes in our minds and what we hear should be regarded as an indispensable acquisition in musical education. It is as imperative that a student should learn to write what he hears and thinks as it is that he should learn to think and to hear what he sees on paper. Deficient as the average student is in discriminating the relationships of tones in intervals and chords, he is even more deficient in discerning rhythms. Grant that he may have an idea of the key-klangs he desires to jot down, in nine cases out of ten he will stumble over an indistinct conception of their rhythm. A great facility in accurate conceptions of rhythms is not so difficult an accomplishment and would prove of inestimable service to every student, and moreover would enable him to decipher the rhythmical sense of many composers who have often failed to write rhythms as they conceived them. Among the master-composers, Schumann is most conspicuous in this connection; his predilection for the obscure, both to the ear and eye, is recorded in many of his works. In a word, Schumann unhesitatingly wrote in dual measure where he intended triple measure, and *vice versa*. Anticipating the possible objection that Schumann knew best what he intended and could write as he chose, it is argued here that the test of a musical thought lies in its *sound* and not in the *sight* of it. That a rhythm should appear on paper exactly as it is conceived is a matter of course, and if more care were taken in this department of notation both composers and readers would be the gainers, inasmuch as the

former would have the satisfaction of being read with more intelligence and the latter would not be mystified. The average student, though he may hear dual and triple rhythms, becomes confused when he is required to read and write them, and this means that he is insufficiently familiar with their appearance on paper. As the same rhythms appear in so many ways to the eye, it is essential that a student should train his eye to recognize them by writing out full lists of such rhythms. For example: students see rhythmical pairs very readily when they appear in half, quarter, and eighth notes, but they look hard and study when 16th, 32d, and 64th notes make their appearance on the page. The case being the same with triplets and still more so with compound, mixed, and irregular rhythms, the advantage to a student of writing out such lists is evident. The principle is simple enough: whatever a student can write he can read. My meaning may be illustrated by the addition of a few lists of rhythmical pairs and triplets. **Ex. 31.**

a). *Regular Pairs.*

Simple.



Compound.



b). *Irregular Pairs.*

Simple.



Compound.



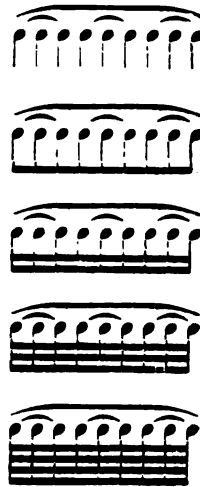
Ex. 32.

a). *Regular Triplets.*

Simple.



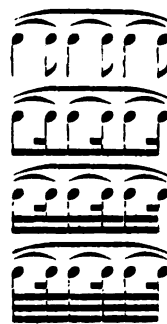
Compound.

b). *Irregular Triplets.*

Simple.



Compound.



Ex. 33.

Mixed Rhythms.

Of course the above lists of rhythms are given here for no other purpose than to suggest the importance of training a student's eye to the various forms in which one and the same rhythm may appear. When abstracted from a prescribed measure and *tempo* the rhythms in any one of the above lists are identically the same. The advantages of executing such lists in writing are apparent, inasmuch as a student learns to select the proper rhythm of his musical thought whatever the unit of the measure may be, and that this exercise in writing contributes its share toward fluent reading is too manifest

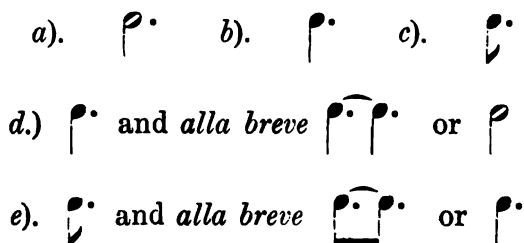
to require further comment. The work of the eye in the music-reader must be the perfection of automatism ; what he sees on a page he must hear: conscious attention to notes and signs is equivalent to spelling and means inattention to sound for the time being. In perfect expression all mechanical processes are in a state of automatism and the mind is conscious of and is bent on but one motive, namely, on the reproduction of an idea. Thus genuine musical eloquence on the part of the singer and player obtains when we are unconscious of the mechanical, and the motor of expression is the feeling of desire and need to give utterance to our emotional experience of ideas, an experience which is alone educable through the intelligence.

A few words may be given here in explanation of a current misconception of *compound measure*. The examples below are generally regarded as coming under the head of compound *triple* measure.

Ex. 34.



The fact that the beat is the unit of a measure and therefore that measures arise when we compound beats, plainly demonstrates all the above measures to be *dual* and not triple. The units of these measures are as follows: Ex. 35.



In all these measures the positive *strong* rhythmical accent begins the measure and the alternating *weak* accent occurs in the middle of the measure. As there is no music apart from measure, the measure rhythm determines whether rhythm is dual or triple. Thus dual compounds of measure units produce DUAL MEASURE and rhythm : triple compounds of measure units produce TRIPLE MEASURE

and *rhythm*. Therefore *a)*, *b)*, and *c)* in **Ex. 34** come under the head of *simple dual measure*, while *d)* and *e)* in the same example must be classified under the head of *compound dual measure*.

The only triple compounds of measure units are as follows:
Ex. 36.

Simple Triple Measure.

Compound Triple Measure.

As the number of measure units, which give rise to measure rhythm, determines whether a measure is dual or triple, the subdivisions of the *units themselves*, whatever they may be, do not disturb the rhythmical current of the measure. **Ex. 37.**

Further illustration of the principle that **ACCENT DETERMINES HARMONY** is unnecessary at this stage. This principle plays so important a part in the ensuing chapters that its validity will undergo a thorough test. The validity of a principle is practically proved when it applies to all cases. Were I to stop here to present illustrations from standard musical works for the purpose of proving that they are all analyzable into harmonics and by-tones, and that they everywhere prove that accent determines harmony, I would not know either where to begin or where to stop, for every page in such works is full of such proofs and no exceptions to the principle of accent ever appear.

Though little more than touched upon here, the Principle of Progression has been explained at sufficient length, and its practical application to our subject may be prefaced by a brief summary.

Every bit of tone-thinking that we do practically proves to us individually :

1. That tones are individual and immutable. Absolute pitch renders this fact indisputable, and as a natural consequence we must regard every interval and chord in the same light :

2. That the system of tones that lies within the limits of one octave and of every octave, and that constitutes a key-group, contains more individual tones than are represented by our musical alphabet :

3. That the number of tones in one and in every octave is limited, whereupon it follows that the number of combinations is limited :

4. That a single tone has no definite musical character or positive tonality, and that tones do not gain such a character and tonality until they are relationed with other tones in some key :

5. That a relation involves a progression, and that the essence of music lies in progression :

6. That tones combine in agreements and antagonisms ; the former, being discriminated by a concomitant sense of repose, are parts of chords ; the latter, being discriminated by a concomitant sense of progression, are by-tones :

7. That every one-voiced series of tones, and therefore every series of tones, is a coalition of melody, harmony, and rhythm ; that each tone represents a certain pitch, klang-color, intensity, and length ; that the harmony that is inherent in every such series determines in what relation one tone stands to the other tones ; that the rhythmical accents determine which of the tones are harmonics and which are by-tones, and that such a series is, all told, a melo-rhythm-harmonic phrase of greater or less length or brevity :

8. That every such phrase plays in a certain key-group and about a certain Tonic and therefore occurs in a certain key :

9. That the current of musical thought is smoothest when it follows on the line of least resistance, and this means when it follows on the line indicated by the key-group. By nature we are habituated to think on the track of the key-group. Education endeavors by erroneous and artificial methods to train the student's mind to follow this track, and therefore *tries to do nature's work over again*, often destroying what nature has provided.

As all musical incidents are key-incidents, and as the key-group is the representative unit of a key, it follows that the key-group is the fundamental basis of music and the standpoint from which all theoretical and practical problems in music must be viewed.

From what has been said so far it will be gathered that the key-group is not the scale, and therefore that the scale is not the fundamental unit on which our music is based. It now remains to explain the exact difference between the two and to prove that the key-group is the power behind the scale which throws light on the still inadequately explained problems of the scale. In short, the key-group represents a complete key-system, while the scale does not; the key-group is the beginning of musical theory and practice, while the scale, though it is a perfect key-incident, plays a secondary part.

The question of first importance is whether a Tonic is a central tone or not. If a Tonic is a central tone, a revolution in the treatment of all theoretical and practical problems in music cannot be averted. If every musician hears that a Tonic is a central tone, then I say it is. If the ear is not the microphone through which the mind analyzes tonal phenomena, then surely the musician must depend on some as yet undiscovered sense.

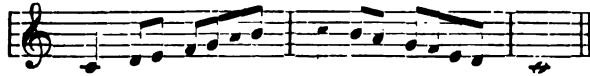
•



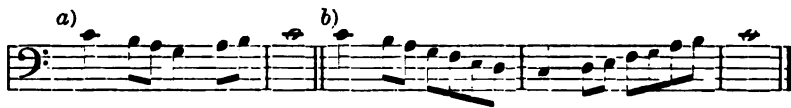
lowe
75

of the scale (the reader is again reminded here that what is commonly known as the scale is only an *over-scale*). The scale rises from an initial tone and fundamental Tonic and returns to it.

Ex. 39.



Although this scale is deeply engraven in the mind of every average musical child, and such a child will readily tell us if, when in singing or playing, we produce the scale correctly, stop short of or trespass beyond the terminal or initial Tonic, omit tones, or in any way deviate from the beaten track; nevertheless, there is a track *under* the initial Tonic which is just as deeply furrowed both in the child and adult. This track is as follows: **Ex. 40.**



In a) the reader will recognize the under-half of the Septonate, and in b) the under-scale.

Our musical thoughts are just as apt to run under the initial Tonic as over it and most melodies illustrate this fact, all of which demonstrates that a Tonic is equally intimate with the tones above and below it and *most* intimate with the tones nearest above and nearest below it, as follows: **Ex. 41.**



The above example represents the Septonate, in which we leave and approach a Tonic from above and below. The beaten track in music is the *key-track*, for the key-system embodies in it the Septonate and the over and under scales, the Septonate being the nucleus of the system and lying midway between the over and under scales.

While progressing on the beaten key-track we are guided by a sense of certain harmonic relations which will be explained presently. Any deviation from this line of least resistance is not only accompanied with an effort, it also changes the concomitant harmony, destroys our sense of the Tonic we set out with, initiates a modulation, and in some instances arrests motion. The following deviations from the track in rising and falling from an initial Tonic will serve as illustrations: **Ex. 42.**



From long practice our scale-habit has become such that we progress from an initial tone to a terminal tone without heeding the points of repose that occur between these extremities and that divide the scale into two tetrachords, or scale-halves. On closer observation these points of repose and scale-halves will appear very prominent.

Let the reader follow on the track of the scale, and carefully note what takes place. While slowly rising from tone to tone, something impels us to halt on the *fourth* tone. While the desire to progress is keenly felt on three tones, progression is arrested on the fourth. We feel that this fourth tone is a terminal point, or point of repose, and therefore it is a Tonic. **Ex. 43.**



Continue in the same deliberate manner on the remaining four tones, and the same experience is repeated, namely, we feel that progression is arrested on the fourth tone. **Ex. 44.**



The natural concomitant harmony in these scale-halves is unmistakably that which arises when we relation a Dominant with a Tonic, as follows: **Ex. 45.**



The half-steps $e \text{ } \flat F$ and $b \text{ } \flat C$ are both unquestionably progressions from a leading-tone to a Tonic. According to the given bass system, the harmony of these halves would be indicated by the numerals V-I. **Ex. 46.**



The selection of any other harmony in these cases would be artificial, while this harmonization is perfectly natural in many voices as well as in two. Thus we may add a fifth, seventh, or even a ninth to the Dominant, all of which added voices only fill out the harmony of the Dominant-klang, which we are irresistibly impelled to resolve into the Tonic-klang. Therefore the four tones in each of the above rising scale-halves are analyzable as follows :

1. *Dominant.*
2. *Passing by-tone.*
3. *Leading-tone.*
4. *Tonic.*

It becomes plain that our scale is composed of two halves, one half being the exact counterpart of the other in its number of tones, in its number and sequence of whole and half-steps, in its melody, and in its harmony. **Ex. 47.**

$$\begin{array}{c}
 \text{C} - \text{d} - \text{e} - \text{F} \\
 \quad 1 \quad 1 \quad \frac{1}{2} \\
 \text{G} - \text{a} - \text{b} - \text{C}
 \end{array}$$

Rise on these halves, and the upper terminal tone is Tonic : F is therefore Tonic of the first half, C of the second.

The initial tone in each half is a Dominant, hence a Dominant lies a **FOURTH** *under* a Tonic and not a **FIFTH** *over* it. As this Dominant lies under the Tonic, I shall henceforth call it the *under-Dominant*. Again, as the first three tones in the above rising scale-halves lie *under* their respective Tonics, I shall hereafter also call these halves *under* scale-halves.

In consideration of these facts an inconsistency between the tones and the order of the numbers 1, 2, 3, 4, will be observed. The Tonic being the principal tone in the group of four, it stands to reason that it must be numbered 1. As the three tones that precede the Tonic lie under it, it stands to reason that they lie a 2d, 3d, and 4th under the Tonic, and should be numbered accordingly. See **Ex. 48.**



The reader will observe in this example that the rising scale of C is equally divided between the two keys of F and C, the first half being the under-half of F, the next being the under-half of C. We shall soon see that the full key-system combines three keys.

I claim that there is a greater intimacy between a Tonic and a Dominant that lies a *fourth under* it, than between a Tonic and a Dominant that lies a *fifth over* it. This point revives an old theoretical problem, for as soon as we link together a chain of these tetrachords, or scale-halves, we never meet what would be a leading-tone, or seventh tone of a scale. Ex. 49.



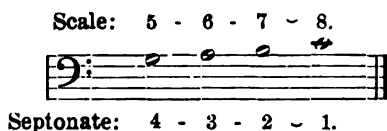
Take the first tone of any of these scale-halves for the initial tone of a scale, and we meet a minor instead of a major seventh, and therefore meet no leading-tone that calls for a resolution into the octave of the first tone. See Ex. 50.



The mystery of this *minor* seventh where there should be a major seventh immediately springs from the habit of regarding the scale as representing the seven key-klangs in their fundamental order of sequence and as the foundation upon which every tonal problem rests. This dilemma is only apparent, and it is practically explained by the above analysis of the rising or under scale-half, in which we found that the terminal tone is the Tonic, that the initial tone is the Dominant, and that the leading tone lies a half-step under the Tonic. The reader will observe that each group of seven tones in the last example is a Septonate, and the four groups present Septonates in the keys of C, F, B \flat , and E \flat . The fact that the four tones must be numbered 4 - 3 - 2 - 1 instead of 1 - 2 - 3 - 4, places this problem in a new light, for a Dominant cannot be conceived as being equivalent to the number 1, nor can a Tonic be con-

ceived as being equivalent to the number 4. The fact that a Tonic must be numbered 1, and the fact that the remaining three tones approach the Tonic from below, conclusively prove the order of numbers 4 - 3 - 2 - 1 to be correct. This problem will be fully explained when we analyze the remaining principal key-klangs.

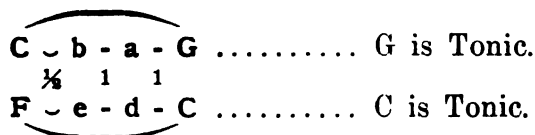
Thus far we have only investigated the upward progression on a scale-half, and have stated that this upward progression creates the same melody and harmony in every scale-half. Again, the scale-half thus far analyzed is that division of the scale that is numbered 5 - 6 - 7 - 8, and that division of the Septonate that is numbered 4 - 3 - 2 - 1. **Ex. 51.**



The other half of this scale of C, namely C - d - e - F, has so far appeared as the under scale-half in F and was numbered accordingly. How this 4 - 3 - 2 - 1 in F is to be converted into 1 - 2 - 3 - 4 in C, so as to become the remaining half of the scale and Septonate of C, may now be considered.

A scale-half has two distinct and positive characters, and the change of character is wrought by changing the direction of progression. Progress *up* and the *upper* terminal tone is Tonic, *progress DOWN and the LOWER terminal tone is Tonic.*

Reverse the progression on each of the two scale-halves and we hear and feel the result to be as follows: **Ex. 52.**



The last tone in these falling halves being Tonic (1), the remaining tones must be numbered according to the position of the Tonic, and therefore according to the numbers assigned to them in the respective scales in which they occur. **Ex. 53.**



Because the upper three tones in these falling halves lie over the Tonic, I call these halves *over* scale-halves.

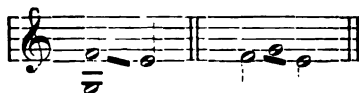
The fact that these halves terminate with the Tonic renders their harmonic analysis very simple, the simplest accompaniment obviously being the under-Dominant klang for the first three tones and the Tonic klang for the last. **Ex. 54.**



The harmony of the under-Dominant klang prevails in the mind even when other voices are added. **Ex. 55.**



The cadence at N. B. and a few other harmonizations of these halves occur so frequently in music that possibly the reader may on first consideration select them. However, C in the upper example and F in the lower are related to their respective Tonics, and this being done, they are first heard as sevenths in the under-Dominant klang, and are conceived as so-called sub-Dominants only on second thought. Attention is here called to the fact that the most *dominant* of the two Dominants in a key-system is the one that I have called the under-Dominant. This is illustrated by the fact that in the Dominant-Seventh chord, which is a coalition of the two Dominants, motion can be resisted on the under-Dominant while motion is irresistible on the so-called sub-Dominant. **Ex. 56.**



It follows as a matter of course that the Dominant in the *over* scale-half lies *over* the Tonic, and therefore its name should be changed from sub-Dominant to *over-Dominant*.

Following are the scale-halves that we have analyzed in their order of sequence in a scale: **Ex. 57.**



In regarding these scale-halves separately, we observe that each half belongs to two distinct keys: the under-half in F is the over-half in C, and *vice versa*; the over-half in G is the under-half in C, and *vice versa*.

Viewing the above scale as a whole, we will observe what may be called a key-triunity, or a triplicity of keys, in the composition of the one key of C, and therefore of any one key. I shall revert to this subject further on.

In passing, attention is also called here to the fact that as F lies over C and as G lies under C, and moreover as these keys of C, F, and G combine in making up one key-system, the key of F lies a fourth *over* that of C, and the key of G lies a fourth *under* that of C. This is in perfect harmony with our habitual method of transposing music, for when we transpose from C to F we transpose a fourth higher; when we transpose from C to G we transpose a fourth lower. In the same way, when we transpose from C to B or A we commonly regard these transpositions a *second* and a *third lower* and *not* as a *seventh* and a *sixth higher*, just as we regard transpositions from C to D and E as a second and a third higher. This point will prove valuable when we come to discuss keys and their relations: it is valuable at this juncture in establishing the Septonate as the unit in which the seven key-klangs are properly distributed, and it is interesting to observe that in transposition we habitually fix the relative positions of tones according to the Septonal index and *not* according to the scale-index.

A scale, in the ordinary sense of the word, contains two Tonics, one at each extremity. Neither one of its Tonics can fill the place of the other, and the omission of either one leaves the scale an imperfect unit. **Ex. 58.**



Although further evidence is available, the above examples prove conclusively that a scale contains eight klangs: therefore the scale cannot represent that tonal unit that contains but *seven* key-klangs. See *b*) in the above example.

A single individual Tonic unites the seven principal key-klangs into a perfect whole; this perfect whole is the Septonate. The two Tonics of the scale are two individual tones and belong to two distinct Septonates. The upper C in the scale is the Tonic of a rising scale-half, and this scale-half represents the under-half of a Septonate; the lower C of the scale is the Tonic of a falling scale-half, and this scale-half represents the over-half of another Septonate. See **Ex. 59.**



The above example presents the under-half of one Septonate and the over-half of another. Add an over-half to the former and an under-half to the latter, and we have two complete Septonates, as follows: **Ex. 60.**



Thus the same individual Tonic is the upper extremity of an under-half and the lower extremity of an over-half; therefore a **TONIC is the common CENTER or NUCLEUS of two scale-halves.**

The Septonate is the perfect unit that presents the true setting of the seven principal key-klangs in their most intimate relations to a common individual Tonic. Following are the Septonates in the keys of C, G, and F. **Ex. 61.**

Voices on the two scale-halves in a *Septonate*, when combined, move *toward* each other in their progress to one and the same individual Tonic, and therefore to a common center : whereas voices on the two scale-halves in a *scale*, when combined, move away from each other, each progressing to another and to its most intimate Tonic, and therefore the scale-halves in a scale move toward *two* centers : briefly then, in the case of the *Septonate* the voices meet while in the case of the scale they separate. Both cases are presented in the following example: **Ex. 65.**

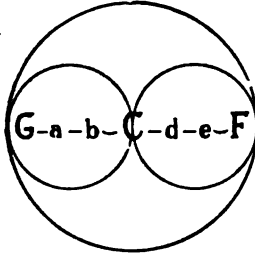


The second example simply presents the *over-half* of one *Septonate* and the *under-half* of a contiguous *Septonate*. The difference between the *Septonate* and the scale is thus made perfectly plain, as well as the fact that the original position of the Tonic is central as in the *Septonate* and not at an extremity as in the scale.

The *Septonal* Tonic is always numbered 1; it is always felt, thought, and heard as 1; being a nucleus, its double character as 1 in $G - a - b - C$ and $C - d - e - F$ is logical and easily conceivable: the step $b - C$ distinctly marks the progression from the leading-tone to the Tonic, and the numbers 2 - 1 are both intelligible and natural.

It is otherwise with the extremity Tonics of the scale: in theory the first tone of a new scale succeeds every seventh tone, therefore we terminate one scale with the initial tone of another, and therefore in theory the step $b - C$ from the leading-tone to the Tonic is numbered $7 - 1$. Now, no one thinks this step as 7 - 1; on the contrary, every one must and does think it as 7 - 8, and this is exactly the way this step should be conceived in the scale. Thus in the scale the Tonic is always an extremity as the numbers 1 and 8 indicate. *The centrality of the Tonic as seen in the Septonate at once clears up the old mystery of the leading-tone and places the scale in an entirely new light.* The steps of the scale numbered 5 - 6 - 7 - 8 are rendered intelligible by their *Septonal* numbers 4 - 3 - 2 - 1, and the progression 7 - 8 from leading-tone to Tonic is always equivalent to 2 - 1.

In continuing our investigation of the Septonate I will employ the circle, as it has proved a most practical means of impressing this view of tonality on the mind. **Fig. 2.**



In the above figure the large circle represents the whole Septonal System; the two smaller circles represent the two halves of the System. The Tonic (C) occupies the center of the large circle, and the entire Septonate is placed *inside* of the large circle to indicate the family of seven tones as a whole, or as a perfect unit. To trespass outside of this circle in either direction is to cross over from one Septonate to another. Each scale-half occupies a smaller circle: as the Tonic belongs to both scale-halves, it does not appear along with the other tones *inside* of the smaller circles, but occupies the point where the lines of the two smaller circles meet, and this point is of course at the center of the large circle. From this figure the student obtains a clear view of the central Tonic with its over 2d, 3d, and 4th and its under 2d, 3d, and 4th, and the impression produced on the mind is a lasting one. The two Dominants G and F are equidistant from the central Tonic and constitute the two opposite poles of the System. Thus the positions of the two Dominants are directly the reverse of the positions allotted to them by past and current theory. For while the Septonal System presents G as *under-Dominant* and under 4th, and presents F as *over-Dominant* and over 4th, current theory makes G the over-Dominant and F the under-Dominant or sub-Dominant. **Ex. 66.**

$$\begin{array}{c} \text{G} \text{ --- } \text{C} \text{ --- } \text{F} \text{ in the Septonal System.} \\ \text{u.4} \quad \quad 1 \quad \text{o.4} \end{array}$$

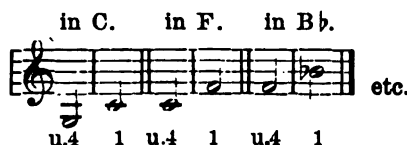
$$\begin{array}{c} \text{F} \text{ --- } \text{C} \text{ --- } \text{G} \text{ in the current system.} \\ \text{u.5} \quad \quad 1 \quad \text{o.5} \end{array}$$

In text books on Harmony the relative positions of the three primary chords are commonly given as follows: **Ex. 67.**



Although these positions of the primary chords and the numerals that accompany them are in perfect accord with the scale, they are strangely inconsistent with the principle that tones, intervals, and chords are individual and immutable, which principle requires no further corroborative proof for its validity than that based on pitch.

We have seen that in progressing up on a chain of scale-halves we are continually representing harmonic relations between initial and terminal tones, which are u. 4—1 in every scale-half. **Ex. 68.**



Again, the fact has been dwelt upon that no tone can be established in the mind as a Tonic, or any other key-clang for that matter, except by thinking it in connection with other tones. Thus none of the Tonics in the above example could be established in the mind apart from their respective under-Dominant clangs. Think the fourth-relation G—C and our concept of C as Tonic is perfect and positive. Our concept of the Tonic C may also be formed through the medium of the leading-tone b_~, but it must be remembered that in this particular relation b_~ is a component part of the under-Dominant clang.

The phenomenon of our natural selection of the G and b *under* C, where we represent C as Tonic, calls forth an observation on the physiological side of voice-production as follows: singers whose tone-attack is imperfect may be heard sliding *up* to a tone when they are beginning phrases or practicing separate tones, but they are never heard to slide *down* under the same circumstances. Every one not a singer is addicted to this vocal error, and the tone thus produced is usually a Tonic, the sliding-up sound being a sort of Dominant or leading-tone. When factory and locomotive whistles are blowing, this same phenomenon is observable: often the whistle does not begin with the full pressure of steam, and the result is that the tone begins lower and rises in proportion to the increase of the

pressure, in which case the listener involuntarily relations the tone of a whistle as a Tonic, or repose-point.

Although in a *single* scale-half we can form a perfect conception of a Tonic and its under-Dominant, the concept of an over-Dominant is quite another thing. For the fourth-relation C—F by itself as well as the scale-half C - d - e ~ F by itself are progressions from the under-Dominant to the Tonic in the key of F. The concept of F as the over-Dominant to C involves the PRECONCEPTION of C as a Tonic. It is plain that in thinking scale-halves separately we never touch upon an over-Dominant, and as our concept of an over-Dominant involves the preconception of a Tonic, it follows that F cannot become established in the mind as the over-Dominant to C until we combine the two scale-halves G - a - b ~ C and C - d - e ~ F into a single system.

As soon as C is established in the mind as a Tonic, F at once becomes its natural over-Dominant. In the following examples progression is no longer arrested on F, complete repose not being experienced until we touch Tonic C. **Ex. 69.**



The principle of the direction of progression has thus far clearly demonstrated the fact that the Dominant G lies a fourth under its Tonic C. This being the case, the positions of the tones a - b as under 3d and under 2d, and the positions of d - e ~ F as over 2d, over 3d, and over 4th follow as a matter of course. From this Principle of Progression we shall presently gather other conclusive evidence in support of the Septonate as shown in **Fig. 2**. The closer proximity of Dominants and Tonics as *fourths* than as *fifths* has much to do with their primal intimacy in the Septonate.

Every musician will admit that the Septonal conception of a central Tonic and three over and three under tones greatly simplifies matters for the music student. Setting out with a single scale-half, based on that commonest of tonal incidents, the fourth, which every child can think, hear, and produce with certainty, the student has no difficulty in adding the other half and quickly learns to master the entire Septonate as a unit. Progressions on one scale-half are interrogative and are responded to by corresponding progressions on the other scale-half. These questionings and

responses, or dialogues of the halves, are calculated to make a lasting impression on a young student's mind and to cultivate an intelligent discrimination and accurate ear. No teacher of music can escape observing these facts; at least the practical application of the Septonate will give every teacher an opportunity to test the truth of these facts. I say *facts*, because I have proved them to be such in teaching during many years. A few examples of the dialogues between two scale-halves are here given: **Ex. 70.**



The dialogue in the *scale* is as follows: **Ex. 71.**



As the two Tonics of the scale are two individual centers of two contiguous Septonates, the above dialogue does not, as in **Ex. 70**, occur in a single Septonate, it occurs in two Septonates. Therefore the responses in the above example are more removed and less positive than those in **Ex. 70**.

The under-half, when we rise on it, is positive and affirms; when we fall on it, it is negative and interrogates. Likewise the over-half is positive and affirms when we *fall* on it and it is negative and interrogatory when we *rise* on it. Thus the negative under-half is responded to by the positive over-half, just as in **Ex. 70** the positive under-half responds to the negative over-half. **Ex. 72.**



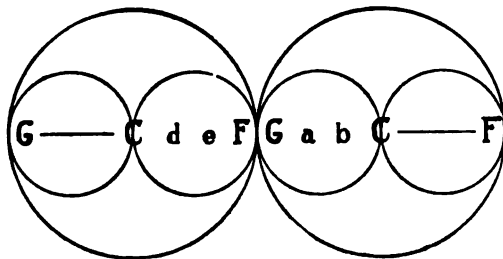
After mastering the Septonate the student learns to understand the scale as he never could otherwise. Prepared as he is by knowing the original positions of the under-Dominant and leading-tone, he readily appreciates how these two tones become a 5th and a 7th in the scale. On no other ground is it possible to conceive of the eighth tone of the scale as the first tone of another scale: the scale-half $G - a - b _ C$ is first learned to be $4 - 3 - 2 _ 1$ in the Septonate, and its scale numbers $5 - 6 - 7 _ 8$ no longer give rise to any confusion

in the student's mind, for he knows how these scale-numbers are to be accounted for, and that they always represent the original 4 - 3 - 2 - 1.

The distinction between a Septonate and a scale having been made sufficiently clear, we may proceed with our analysis.

I need hardly say that all illustrations are given in the key of C for the purpose of simplifying presentation. There is however a more important reason for the selection of this key, for in my centralized System of keys the natural key of C is the *central key* of the System, all other keys standing in a more or less intimate or removed relation to the *central key* and their positions being relative to that of the *central key*.

The following figure illustrates the scale from Tonic to Tonic in its progress from the center of one Septonal circle to the center of another : Fig. 3.



While slowly moving *up* on the scale, the mind does not anticipate the *upper Tonic* C until G is touched; therefore not until we have stepped from the upper pole of one Septonate to the lower pole of another Septonate: in other words, not until we have crossed over from one Septonal circle into another. However at the very moment G is touched we anticipate the upper Tonic C.

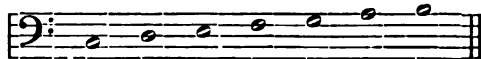
Likewise, when we reverse the direction of progression and slowly move *down* on the scale, we do not anticipate the *lower Tonic* C until F is touched; therefore again, not until we have crossed over from one Septonal circle into another. Here as before, at the very moment we reach F we anticipate the lower Tonic C. In moving up or down on the scale slowly or rapidly the responses of the second or positive scale-half to the first or negative scale-half are distinctly perceived: the first half moving *away from* a center and therefore interrogating, the second half moving *toward* a center and therefore replying. Again, on a scale-half we glide easily and naturally from its initial to its terminal tone; however,

when we step from the terminal tone of one scale-half to the initial tone of another, we are sensible of a transition or reaching over: in other words, while it costs no effort to move on the scale-half, it does cost a slight effort, comparatively speaking, to make the transition from one half to another.

The scale as presented in Fig. 3 is an inter-Septonal and an *octonal* incident, and therefore not a unit composed of *seven* tones, as it is generally supposed to be. The scale-system occurs in the key-system, but as we shall see presently, it does not present a *complete* key-system, and the separate analysis of the two systems puts an end to much confusion.

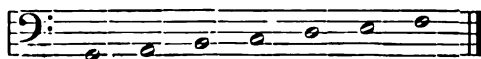
As all music is based on a key, as the key is based on its nucleus, the Tonic, as tonality is based on Tonic-relations, and as these Tonic-relations are most intimate in the Septonate, there is no alternative but to substitute the Septonate for the scale as the presentative fundamental unit in music. My *data* in support of this view are by no means exhausted, as the succeeding chapters, in which I treat Intervals and Chords, will show. It may be added here that the fundamental bass numbers V, VI, and VII^o, are scale numbers and are rendered superfluous by substituting the simpler and more logical numbers of the Septonate. Both the customary fundamental bass numbers and the Septonal numbers are given below for comparison. We shall see later on that these Septonal numbers indicate the *roots* of chords, and that roots are not necessarily fundamental basses. **Ex. 73.**

Scale.



I II III IV V VI VII^o

Septonate.



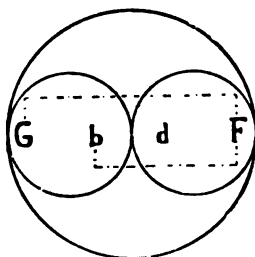
u IV u. III u. II^o I o. II o. III o. IV

During my earliest musical studies I was unable to understand why a leading-tone was an *over* seventh, simply because it had no melodic relation to the first tone and was never resolved into this first tone. This perplexity, which many fellow-students shared with me and which teachers and text-books could not adequately explain, is at once removed by the Septonate, in which the leading-tone appears as an under second, from which position it always leads up

to and is resolved into the first tone. Again, it was a mystery to me why the Dominant, the Dominant chord, the Dominant-Seventh chord, and the diminished triad were placed a fifth and a seventh *over* the *lower* Tonic, for they were always resolved into the *upper* Tonic-chord and *never* into the *lower* Tonic-chord. Again the Septonate explains and removes these difficulties, for in the Septonate the root and 3d of the Dominant-Seventh chord lie *under* the central Tonic, while its 5th and 7th lie *over* the central Tonic, and all its voices move *in the direction of the central Tonic*. Likewise, the root of the diminished chord lies *under* and its 3d and 5th lie *over* the central Tonic, and its voices all move in the direction of this Tonic. Both cases are illustrated here. **Ex. 74.**

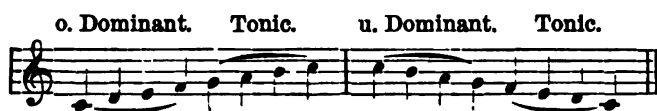


The Dominant-Seventh chord occupies the Septonate from pole to pole: this chord as well as the diminished triad appear in the Septonal circle as below. **Fig. 4.**




In the succeeding chapters on Intervals and Chords the above points will receive further attention. There are still a number of problems connected with the scale that require consideration.

The ascending scale consists of two *rising* halves, the descending scale consists of two *falling* halves. The first rising half terminates with the over-Dominant and may be called the over-Dominant half: the second rising half terminates with the Tonic and may be called the Tonic-half. Likewise, the first falling half is the under-Dominant half and the second falling half is a Tonic-half, as follows: **Ex. 75.**

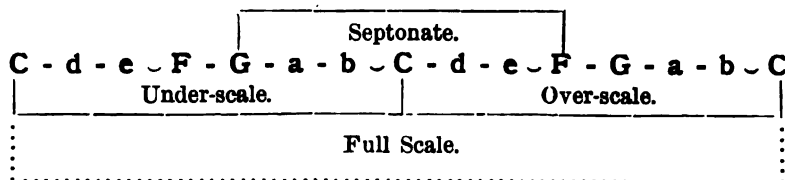


In the example there are two positive Tonic-halves, an upper half and a lower half. There can be no question as to which of the two Tonics is the root of the scale. Now the question arises, does the above scale in one octave represent the *full* scale. I reply that it does not, that it represents but one half of the scale-system. For

just as the initial Tonic  is a Septonal center, so also it is a *scale* center: just as this individual Tonic is one common center or nucleus of the under and over scale-halves in the Septonate, just so *it is the common center or nucleus of an under-scale and an over-scale.*

As a tone has as many relations with tones under it as it has with tones over it, it follows that *a tone is the center of all its relations*, or briefly, *a tone is an harmonic center.*

As in **Ex. 75** we started on a scale-center, moved up and away from it to its upper perfect octave and then returned to it, we only made one-half of the circuit of the full scale. The complete circuit of the full scale is not made until we again start on a scale-center, move *down* and away from it to its *lower* perfect octave, and then return to it. By adding a contiguous scale-half both over and under the Septonate we perfect the full scale as follows: **Ex. 76.**



In the following example *a)* shows the circuit of the Septonate and *b)* that of the full scale. **Ex. 77.**

a) o. Dom. Tonic. b) o. Dom. Tonic. u. Dom. Tonic.

u. Dom. Tonic. u. Dom. Tonic. o. Dom. Tonic.

The above Tonic center  is the central tone and the main center of the System.

The above Septonate is the central Septonate of the System and the above full scale is the central scale of the System. The key of C is the central key of the System.

The full scale, as here presented, occurs in three contiguous Septonates: starting with the nucleus of the central Septonate, the scale proceeds up and down to the centers of an over Septonate and an under Septonate and covers the ground of two perfect octaves.

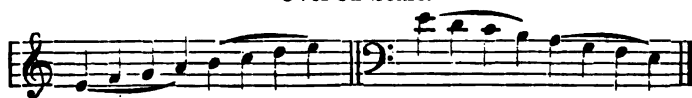
The division of the complete scale into an over-scale and an under-scale; its subdivision into rising and falling scale-halves; the clear view of the position of each tone in a certain scale-half in the Septonate and in the over and under scales; the easily appreciable relation of each tone to the central Tonic, and to the other tones of the particular scale-half, Septonate, and over and under scale, to which it belongs; the easily distinguishable duality of the character of each tone as a Septonal and a scale incident; in short, the relations of each tone to all the parts and to the whole of the System; all these points, and others which need not be mentioned here, testify to a practical educational value of the System which cannot well escape the observation of all teachers of music. For the music student begins by thoroughly mastering the melodies and harmonies in one scale-half, he then adds and masters another scale-half, and thus thoroughly acquaints himself with the melodies and harmonies in one Septonate; in the same manner he proceeds to build the over and under scales, and in this way learns to master the complete System perfectly. How rapidly and thoroughly the student accomplishes all this, and how accurately this method teaches him to think and hear, no teacher will fully appreciate until he has tried it himself.

Every singing-master will readily appreciate the practical value of the central Tonic, of the scale-half, of the Septonate, of thus starting with a little and gradually mastering the whole, and of the Principle of Progression, in the development of the voice. Let singing-teachers develop voices on this centralized Tonic and scale-half basis, and singers with a faulty intonation will cease to be such common phenomena. Thanks to the great advance toward rational singing methods inaugurated by Julius Hey and J. Faure! Is there no one who can do for the English language what these eminent men have done for the German and French languages!

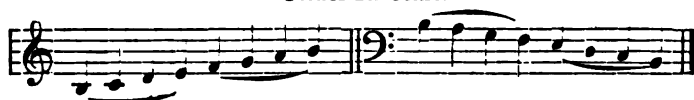
In view of what has been said thus far, objection must be taken to the hypothesis which Dr. Riemann has resurrected and elaborated into a system of Harmony, namely, that major and minor are polar opposites; the former being generated from a root at the bottom and resulting in a pure major scale, the latter being generated from a root at the top and resulting in a "pure" minor scale, thereby assuming that minor is major turned upside down. The science of Acoustics furnishes *data* in support of this conception of major harmony and a major scale, but furnishes no *data* in support of this notion of minor harmony and a minor scale. The word *minor* in its acoustical as well as in its musical sense means dark, rough, and impure, minor being antiphonous to major, which is bright, smooth, and pure. Both in its physiology and in its effect on the mind, the minor klang is rough and impure; and the minor klang like the major klang being conceivable only in harmony, it stands to reason that *pure* minor harmony does not exist, and we shall see presently that there is no such thing as a *pure* minor scale, nor is there such a thing as an independent *minor key*. In view of the facts that the System set forth in these pages is established on psychological principles, which are in perfect harmony with the ear, and *starts with the Septonate for its basal unit*, while the Riemann system *starts with the scale for its basal unit* and develops an under-scale on an acoustical hypothesis which in no way accords with the ear: it becomes obvious that the two systems differ at their foundations, and consequently are independent of one another. Even if I considered the scale to be the basal unit in music, I should object to the Riemann under-scale or "pure minor scale" on these grounds, namely: the tones of this under-scale stand in a removed harmonic relation to an *assumed* Tonic; the scale digresses from the beaten track, or line of least resistance; the mind selects its steps with an effort; and moreover the initial tone of this scale is *not a Tonic, for in this relation it cannot be conceived as a point of absolute repose*. The Riemann under-scale, as well as the natural under-scale, which represents the beaten track, and the steps of which we select without effort, are given below. **Ex. 78.**



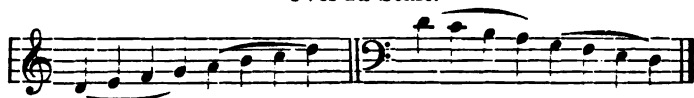
Over-3d Scale.



Under-2d Scale.



Over-2d Scale.



C being the point of absolute repose in all of these forms as well as in the Tonic form, it follows that all these scales are incidents in the key of C. Thus in every key there are *seven* forms of the major scale. Here we observe how all ancient tetrachords and scales are embodied in our modern Tonal System, and this perfect completeness of the System must be regarded as one of the wonders of mental evolution.

The student that knows only the Tonic form of a scale is imperfectly acquainted with the complete scale-system. Let him learn not only the scale-halves of the Septonate and of the Tonic scale, but also all the tetrachords in the six remaining forms of the scale, let him combine scale-halves and tetrachords in two, three, four, and more voices, and his control of the entire System will be immeasurably facilitated while his ear will become very exact. A few combinations of reciprocal and parallel halves and tetrachords may be given here: **Ex. 80.**



The teacher of music will see that a student can soon learn what halves and tetrachords combine in both parallel and opposite motion, and that such exercises as the above, when thought out and written by a student, must be efficacious.

Just as there are seven forms of a scale, each of which starts on one of the tones of the central Septonate, so also there are other

intervals besides Tonic intervals, that abound on every page of music. In the succeeding chapter these intervals will be described, and they consist of under and over Dominant intervals and under and over 2d and 3d intervals.

When we undertake to sound musical problems in the light of Acoustics, more or less confusion is sure to arise. The conception of the scale (our over-scale) as being based on the Tonic triad and as consisting of the component parts of this triad with passing tones from one such part to another is untenable. **Ex. 81.**



Whatever Acoustics may have to say about the harmonic constitution of tones, it is another matter when we analyze tones with regard to their relation to music. In the language of tones no tone has any positive character except in relation with other tones, and this relation, to be positive, must be a key-incident, and the harmony that concerns us in music is the harmony that springs directly from such a relation and that changes with every change of such a relation. In the above analysis of the scale it was substantially proved that the harmony of the scale is not alone that of the Tonic chord, but is divided between the Tonic chord and the two Dominant chords. It would be difficult to prove whether the tones which we hear faintly sounding along when we are thinking a single tone are partial overtones inherent in the single tone, or whether they are other tones which we from habit mentally connect with the single tone for the purpose of establishing the single tone in some positive relation. However, we may say with certainty that when we think several tones in some positive relation, the partial overtones and undertones inherent in each tone of the series are not heard, owing to the predominance of the harmony that springs directly from such a positive relation. While thinking on a single tone, the most prominent partial tone that is heard is the upper octave, and for this reason the octave is the easiest interval to touch. But the nucleus of our System, namely, the Septonate, lies within the limits of one octave, its largest interval being a *seventh*. The perfect octave of every member of the Septonal family of tones occurs in another higher or lower Septonal stratum and is the point by which all higher and lower strata are united into a complete System, the central Tonic being the center of the System and all its higher and lower octaves being the center

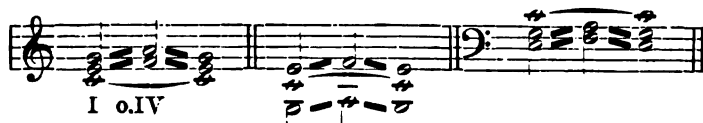
of their respective Septonates. *As the seven principal key-klangs lie close together about their mutual Tonic in a single Septonate, and as these seven klangs are at the foundation of all music, it follows that the harmony that resolves these klangs into a perfect key-system and that springs from the relations between three under and three over klangs and a central Tonic must be the natural harmony on which our System of Tones is based.*

Although the evidence thus far furnished in support of my claim that the original position of a Tonic is at the center of a Septonate and *not* at the extremity of a scale is sufficiently convincing, there is still further incontrovertible proof at my disposal. Let us connect the Tonic chord with its two Dominant chords, and the principle of the direction of progression will demonstrate with certainty that a Tonic is a center, and that its two Dominants lie a fourth under and a fourth over it.

When we connect the chord of G with the Tonic chord, all progressing voices move *up*; return from the Tonic chord to the G chord, and the direction of the progressing voices is *down*. This proves beyond doubt that the G chord lies *under* the Tonic chord, and therefore that G lies a fourth *under* the Tonic C and is the *under-Dominant* of C. **Ex. 82.**



Now connect the Tonic chord with the F chord, and the direction of the progressing voices in the former is *up*; return from the F chord to the Tonic chord, and the direction of the voices is *down*, all of which proves that the F chord lies *over* the Tonic chord, that F lies a fourth *over* Tonic C, and that F is the *over-Dominant* of C. **Ex. 83.**



The above examples illustrate the fact that in whatever positions we connect these primary chords, voices on the under-Dominant chord approach the Tonic chord from *below*, while voices on the over-Dominant chord approach the Tonic chord from *above*.

The line of the direction of progression, which we irresistibly follow when we relation tones and chords as pure key-incidents, is

the line of least resistance and that of natural selection. On this beaten key-track we have found the Septonate to be a perfect unit in seven tones and the true and natural foundation of the small key-group in *one* tone-stratum. We have shown, on the other hand, that the scale is rendered an imperfect unit when the *eighth* tone is omitted, and no one can question that this eighth tone is as indispensable a part of the whole scale as are any of its seven other parts. Besides, it has been shown that a scale is an inter-Septonal incident and occurs in *two* tone-strata. It is obvious that a system of seven principal key-klangs cannot have a system of eight principal key-klangs like the scale for its basal unit, and therefore I claim that the Septonate comes first in music theory and that the scale must be accorded a secondary place.

In view of the fact that each tone in the System is individual and that its pitch can undergo no modification, it follows that the intermediate tones, which have hitherto been regarded as modified principals, are also individual and unchangeable and therefore belong to the key-system. Let us investigate these intermediates, and we shall better understand the three keys that unite in a single key-system and that were previously referred to as a key-triunity. The change wrought by the centralization of the Tonic will naturally place the problem of the relative positions of keys in another light, and the classification of the positions of intervals, chords, scales, and keys as central, over, and under is an immediate and unavoidable consequence.

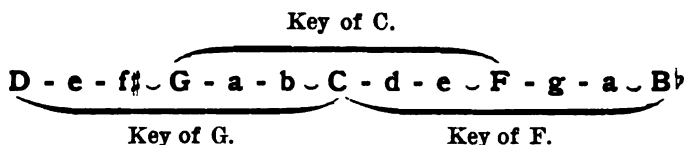
Each principal lies between two intermediates; I name these intermediates *upmediates* and *downmediates* according to the direction of progression. Voices on *upmediates* (so-called *raised* tones) progress *up* one-half step; voices on *downmediates* (so-called *lowered* tones) progress *down* one-half step, as follows: **Ex. 84.**



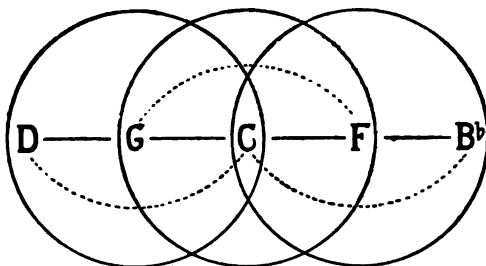
The natural key of C is the central key of the Tonal System, and the central key-group of C occurs in the central tone-stratum of the System. All other keys are more or less closely or distantly related to the central key of C, and the tones of all keys play some part in the central key, so that each tone in a single stratum of the central key, be it a principal, an upmediate, or a downmediate, may be converted into a new Tonic or into any other key-klang by the

process of Modulation, which process will be considered in the concluding chapter. In other words, a single tone-stratum of the key of C contains the Tonics of all keys and fractional parts of the tone-strata of all keys. In this way all keys are centralized in a single tone-stratum, and we shall see that this conception affords a most comprehensive as well as a clear view of the relations of all keys to the central key of C.

For the present, attention is called to the relative positions of the central key of C and the keys of G and F, with which the key of C is most intimately associated in a key-triunity. The key of G is the contiguous under key to C, and the key of F is the contiguous over key to C, as follows : **Ex. 85.**



The great intimacy and close kinship of these three keys lie in the harmonic relations of their primary klangs, and therefore in their fourth-relations. The relative positions of these primary klangs, their relations in each key, and their correlations in the three keys may be best viewed in the following Septonal circles : **Fig. 5.**



In this diagram the central tone C appears in its five principal harmonic relations as follows : First, as Tonic and center between two equidistant Dominants ; second, as under-Dominant to F ; third, as over-Dominant to G ; fourth, as under-seventh to B♭, together with which it forms the Dominant-Seventh chord of the key of F ; and fifth, as over-seventh to D, together with which it forms the Dominant-Seventh chord of the key of G.

Each of the above circles, when regarded separately, presents an independent key with its Tonic as center and its two Dominants as extremities. These three principal members of the key family I call *fixed* tones, for the reason that these tones remain undisturbed

in minor as well as in major. In the above regular chain of perfect fourths, it will be observed that the natural harmonic seventh over C is $B\flat$ and *not* $B\sharp$ (German: *H*), and this is in perfect accord with the laws of Acoustics. The G circle contains among its fixed tones no foreign tone to the C Septonate, and therefore the keys of C and G are more intimate than the keys of C and F. The key of F contains $B\flat$ among its fixed tones, and $B\flat$ is foreign to the C Septonate. Hence the nearest related under key is more intimate with a central key than the nearest related over key. This again demonstrates that the upward progression from an under-Dominant to a Tonic is the closest harmonic relation that exists in music, and this upward step of a perfect fourth is moreover the most common and most positive interval in music. Any average musical child can hear, think, and sing this fourth, and can readily interpolate a second and third tone and thus complete the scale-half. In this way a child gets hold of something which it can master as a whole, and therefore of something positive and tangible within the reach of its mental grasp, a thing that is impossible with a scale of eight tones. Therefore this little scale-half is the simplest basis upon which to cultivate exact and intelligent hearing, genuine tone feeling, tone thinking, and pure utterance. The scale-half is not only a simple means to such desirable ends, it is a *sure* means.

The above figure presents other important relations, which every musician will observe, and which need not detain us here. The relative positions of the three keys of C, G, and F, as represented in this figure, may serve as an illustration of all other key-triunities, and their positions may be described as follows :

1. Key of C—*central key*.
2. Key of G—*under-fourth key*.
3. Key of F—*over-fourth key*.

A few examples of other key-triunities are given here : **Ex. 86.**

$\overbrace{A-D-G-C-F}$ key of G and kindred keys.

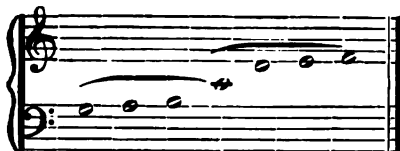
$\overbrace{G-C-F-B\flat-E\flat}$ key of F and kindred keys.

$\overbrace{B-E-A-D-G}$ key of A and kindred keys.

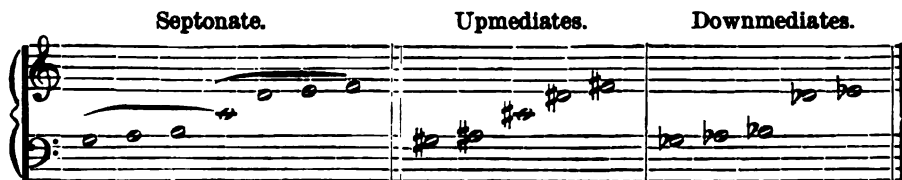
$\overbrace{F\sharp-B-E-A-D}$ key of E and kindred keys.

Before proceeding with the centralization of keys, and in order to avoid all confusion which might possibly arise from the use of the terms the *Septonate*, the *small key-group*, the *large key-group*, and the *full tone-stratum*, I will make a brief repetition by defining exactly what each of these terms denotes :

A **SEPTONATE** is composed of the seven principal tones and is the foundation of a small key-group. **Ex. 87.**

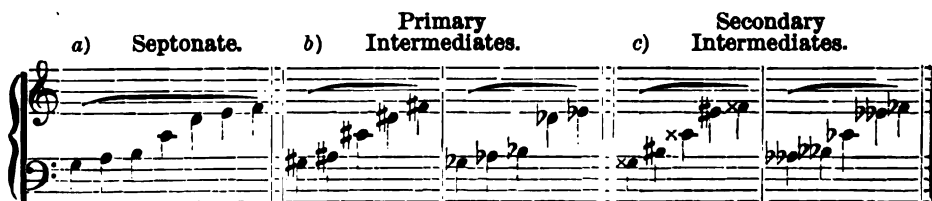


A **SMALL KEY-GROUP** is composed of a Septonate together with the ten primary intermediates and therefore contains seventeen tones. **Ex. 88.**



A **LARGE KEY-GROUP** is composed of three contiguous small key-groups : it therefore contains a central, an over, and an under Septonate, together with all the primary intermediates ; thus the total number of its tones is fifty-one.

A **FULL TONE-STRATUM** is composed of a Septonate, ten primary intermediates, and ten secondary intermediates, and therefore contains twenty-seven tones. Following is the full **CENTRAL** tone-stratum : **Ex. 89.**



These twenty-seven tones represent the twenty-seven Tonic-centers of twenty-seven possible keys, all of which are centralized within a single tone-stratum. According to this new conception all keys center in and radiate from the *central* tone-stratum, each tone of which represents a central Tonic of a central Septonate of one

of twenty-seven keys. Thus inside of a single tone-stratum we can modulate from and to any one of twenty-seven keys, all of which will be more fully elucidated in a later chapter. If I regarded major and minor keys as distinct keys, as is usual, then the above single tone-stratum would contain the Tonic-centers of twenty-seven major keys and of twenty-seven minor keys, and would thus aggregate a total of fifty-four keys, to and from all of which we can modulate without trespassing outside of a stratum.

I divide keys into three groups :

The *First Group* includes every key whose Tonic-center is one of the principals. There are seven such keys : see **Ex. 89 a**).

The *Second Group* includes every key whose Tonic-center is a primary intermediate of the central key-group of C. Of these there are ten : see **Ex. 89 b**).

The *Third Group* includes every key whose Tonic-center is a secondary intermediate. There are ten such keys, although only two of them (C \flat and F \flat) are at all common in musical writings, appearing only as episodes : none of them are employed as the leading key in a composition.

Thus as every key-center in music is centralized in the central tone-stratum (**Ex. 89**), and as the structure of the central tone-stratum is based on the central key of C, it becomes plain that every key stands in some more or less close or in some more or less removed relation to the central key. It stands to reason that the student can far more readily appreciate this relation where the Tonics are in such close proximity and affinity as they are in the central tone-stratum than he can according to the customary method of distributing keys. All this will become more obvious in the subsequent chapters, and the above division of keys into three groups will appear more logical when we proceed to divide intervals and chords respectively into three similar groups.

The practical value of this centralization of keys in furnishing the music student a more easily appreciable and comprehensive view of the interrelations of keys than is possible with current methods cannot be fully and justly estimated by teachers until they put it to a practical test. The confusion arising from the current methods of dividing keys into *flat*-keys and *sharp*-keys, especially in relation to notation, has been dwelt on by me in a separate paper. As has been said before, sharps and flats are signs and not tones, and the lack of making a proper distinction between a tone and its sign is the chief cause of the evil. It is only reasonable

that a sign should always indicate the exact relation in which a tone occurs and therefore the direction in which a voice progresses : if this principle were rigorously adhered to by composers, reading music would soon become *tone*-reading instead of *note*-reading, and moreover, such a logical relation between a tone and its sign would be an immeasurable auxiliary to intelligent reading ; for to read means to grasp the tonal content or musical idea at sight. Anything short of doing this at sight is spelling and not reading. To read a book at sight is a common every-day matter and the term *at sight* appears very ridiculous in this connection. The term is equally ridiculous in music, in the face of the fact that reading music is a far more complex mental act than reading a poem. Psychologically speaking, the two cases differ in degree only and not in kind, and if music involves the greater difficulty there is no alternative but to surmount it or let music alone and take up some less difficult study and calling.

There is but one fundamental key and but one natural pure scale, namely, the major key and scale. Why a *fundamental minor key* and a *pure minor scale* are inconceivable is not so difficult to explain when we take the ear for our judge. Major and minor are purely harmonic distinctions and percepts : both harmonically and psychologically they represent the light and darkness, the bright and sombre klangs, the smoothness and roughness of tonality.

In the preceding analysis we saw that the foundation of the key-group, namely, the Septonate, and the natural pure scale, namely, the inter-Septonal scale, are based on the harmony of the three primary klangs. It has been demonstrated that when we mentally combine these three primary klangs, we are guided by their concomitant harmonies and are therefore in reality combining the three primary chords. It was explained that this concomitant harmony is always present in the mind whenever we think a series of tones, whether we are conscious of its presence or not, and that this harmony alone enables us to form a distinct concept of the relation in which a tone occurs. Hence apart from their concomitant harmony and their harmonic correlations we cannot conceive a positive Tonic-clang, an under-Dominant-clang, or an over-Dominant-clang. Now, these facts place the problem of a *pure minor scale* and an independent minor key in a new light, inasmuch as the natural concomitant harmony of the three primary klangs is MAJOR ; and in combining these we follow the beaten track and select major klangs and therefore major chords at each step.

When we select a minor Tonic-klang we leave the beaten track, and this costs a slight though perceptible effort. Although a Tonic-klang may be conceived either as a major or a minor klang, nevertheless both of these Tonic-klangs depend on the same under-Dominant for their genesis in the mind, and in this relation with a Tonic the under-Dominant is *always* a MAJOR klang and *never* a MINOR klang. I repeat, a Tonic-klang, be it major or minor, cannot be generated and established in the mind except in correlation with a *major* under-Dominant.

The so-called minor key with its three primary minor chords, although it is the harmonic counterpart of the major key, cannot be regarded as an independent key, simply because the generation of a minor Tonic like that of a major Tonic is possible only in conjunction with a *major* under-Dominant. In *a)* of the following example the second chord fails to produce that feeling of absolute repose and resolution which is the klang characteristic of a Tonic, while in *b)* the sense of Tonic is perfect. **Ex. 90.**



Again the *minor* over-Dominant chord is more intimate with the major than with the minor Tonic-chord. **Ex. 91.**



The above progressions $F \text{ minor} - C \text{ major}$ and $F \text{ minor} - G \text{ major}$ are irresistible and our first choice, while the progression $F - e \flat$ would have to be pre-meditated.

This inseparability of minor from major, as illustrated by the fact that the so-called minor key is no key at all except in conjunction with a major under-Dominant, plainly demonstrates that there is no such thing as an independent minor key. The term *key* is therefore misapplied in connection with minor, and the harmonic counterparts, namely, major and minor, must be distinguished from one another by some other term. For the lack of a better term for this purpose I employ the word *mode*.

As all music takes place in a key, and its harmony is con-

stantly changing from major to minor and *vice versa without changing the key*, the central Tonic of which may be either a major or a minor klang, therefore I take this position, namely, that *a single key has two modes: a major mode and a minor mode*. The major mode is the fundamental and pure mode; the minor mode is the mixed and sombre mode. Both the major and minor modes of one key occur in the small key-group. The major mode is composed of the principal key-klangs; the minor mode is a mixture of principals and intermediates. The Tonic is the central tone of a key, and is therefore at once the central tone of both a *major* and a *minor* mode. The Septonate of C minor is as follows: **Ex. 92.**

G - a \flat - b \flat - C - d - e \flat - F

The minor scale, like the major, progresses from the center of one small key-group to that of another, and like the full major scale, the full minor scale makes a circuit of two perfect octaves and touches the centers of the three contiguous small key-groups, which collectively constitute a large key-group.

The typical minor scale, which is the harmonic counterpart of the major, as well as the so-called relative minor scale, are as follows: **Ex. 93.**



At N. B. the reader will recognize the scale which has already appeared as the under-3d form of the major scale of C. See **Ex. 79.**

Other tetrachords and scales abound in practical music, and they also must be classed as mixed scales. Of such scales there are both major and minor.

The following are minor scales inasmuch as the characteristic minor third to the Tonic, and the fixed tones, remain undisturbed. **Ex. 94.**



So long as the characteristic major third and the fixed tones are not interfered with, such mixed scales are major, as follows:
Ex. 95.



The scales in the above two examples are nothing more than arbitrary deviations from the beaten track and natural scale; apart from the fact that they further demonstrate that there is but one natural and pure key and scale and that they are all analyzable as incidents in the two modes of one key, no significance is attached to them here.

My conception of the harmonic centrality of a tone and the centrality of a Tonic rendered the classification of the positions of

key-klangs, intervals, scale-halves, scales, chords, and keys as central, over, and under a necessary and an unavoidable consequence. The process of centralization once begun, naturally had to be carried through the entire System. Dr. Riemann's classification of intervals, scales, and chords as over and under was the product of a widely different line of thought, as every one knows that is acquainted with his system. I had introduced my System of over and under intervals, scales, and chords in my Harmony classes several years before the Riemann system was known to me.

CHAPTER IV.

INTERVALS, OR MELODIES OF STEPS.

Analysis and Classification.

FROM current definitions of musical intervals a student learns the numerical relation in which a second tone stands to a first, and this mental exercise amounts to an abstract and mechanical computation of the exact distance from one tone to another. To the average student of Harmony primes, 2ds, 3ds, 4ths, and so on are mere numerical terms by which the various intervals are known, while such qualifications as major, minor, augmented, and diminished serve as a means by which to distinguish the various modifications of any one interval. Although major and minor appeal directly to the klang-character of tones, yet to the average student they mean nothing more than large and small, just as augmented and diminished mean enlarged and contracted.

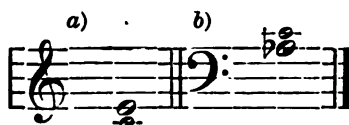
Apart from the fact that the pitch of a tone, and therefore an interval, cannot be modified, this mechanical measuring off of intervals is correct enough as far as it goes. It does not go far enough. Such mental exercise amounts to so much mathematical practice, in which the tone-sense and the intellectual ear play no part, and therefore affords no stimulus to the exercise of the nascent musical faculties. This is why the average student of Harmony cannot hear intervals and recognizes them only at sight in print or on an instrument. The intuitive ear can distinguish progression-tones from repose-tones and dissonances from consonances, but it requires an educated or intellectual ear to *discriminate* these phenomena. The psychological principle of intelligent hearing is very simple: whatever tone-relations the mind can represent independently, the mind can hear: thus any interval, harmony, or rhythm, that we can think, we can recognize when we hear it. If the ear is not the organ to be intellectualized in music, what organ is!

A definition should be such that it directly stimulates the brain

to conceive the true essence of the object or thing defined. In this way we gain a concrete experience of the thing defined, be it tone, form, or color.

The essence of an interval lies in the progression of a voice from one tone to another. Coincidences of two or more tones are coincidences of two or more voices, and are chords, not intervals. Thus an interval is named according to the length of a step from one tone to another, and the essence of an interval lies in the characteristic *klang* or melody of such a step. Of course differences in the klangs, or melodies of intervals, are due to the different lengths of steps; but they are also due to the particular relation in which they occur, for one and the same interval, say a major third, has a very different *klang* in different relations. This point appears to have been overlooked heretofore and will be duly considered. Each interval has two characteristic melodies, one in rising and one in falling: thus we recognize all intervals of one variety, say perfect fourths, by the similarity of their melodies. These explanations indicate plainly enough that the music student must produce his intervals mentally, that such mental exercise develops a retentiveness of the klangs or melodies of intervals, apart from which the intellectual habit of accurate hearing cannot obtain. It is unnecessary that the student should hear the exact letters of an interval; it is sufficient at the outset that he learns to hear the exact *klang* of a step and *always* knows its relation to a certain key, knowing which, he can think it in any key he is familiar with. There is a way to cultivate a sense of exact pitch which I cannot stop to consider in this abstract beyond merely mentioning that its acquisition depends on the observation of the natural key of our individual voices in speech. With proper practice this observation can be made, whereupon it becomes an easy matter to pronounce the exact pitch of tones. The average music student finds no application for his theoretical knowledge in practical music; however, this cannot happen if the method of mental practice of intervals, chords, and rhythms, which is set forth in these pages, is pursued. To study harmony apart from melody and rhythm is to separate the three factors of music, and the three factors being inseparable and being appreciable only in their inter-relations, the current methods of instruction in Harmony are inefficient. Studying means reasoning and thinking, and the music student that is not brought up on the reason why and that does not think, cannot become anything more than an intuitive musician.

The key being the nucleus from which all music germinates, the klang of an interval is not perfectly conceived until it is thought in relation with a key. Thus the two tones that form an interval must be conceived as keyklangs, and this conception involves other tones besides the two that make up the interval. **Ex. 96.**



In this example the major over-3d E and the under-3d A \flat are conceived as major thirds by thinking them in relation with C. Thus in pitching the above E and A \flat as major thirds we cannot do so except through the medium of C.

Although we may conceive these intervals as major thirds, we have not yet thought them in relation with a key, and until this is done the conception is imperfect. No tone is perfectly conceived in music until it is thought as a keyklang. Thus every tone may be conceived as a Tonic, an over-2d, 3d, or 4th, or as an under-2d, 3d, or 4th. C in the above example can therefore be represented in thought as any one of these seven keyklangs as follows:

C may be conceived

1. As a Tonic in the key of C,
2. As o. 2d in the key of B \flat ,
3. As o. 3d in the key of A \flat ,
4. As o. 4th in the key of G,
5. As u. 2d in the key of D \flat ,
6. As u. 3d in the key of E \flat ,
7. As u. 4th in the key of F.

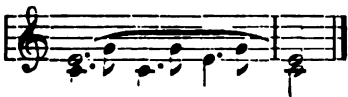
But this is not all. C occurs in many keys as an intermediate and may be so conceived in all such keys.

Obviously then, the major thirds in **Ex. 96** may be conceived in many keys, but are not perfectly conceived until they are relationed in some particular key, and of course this is the case with every interval of every variety. Thus the concept of the major o. 3d E as an incident in the key of C cannot be generated in the mind except by preconceiving C as a Tonic, and as has been explained, our concept of a Tonic cannot be generated except through the medium of its under-Dominant klang. The major o. 3d E is therefore relationed as an incident in the key of C about as follows: **Ex. 97.**



Thus the proposition with which we set out, namely, that a perfect concept of an interval involves other tones besides the two that form the interval, is substantially proved.

It is worth a moment's digression to call attention to the fact that it would be most unnatural to generate the Tonic in the last example by means of G *over* C, according to the scale. This furnishes another illustration of the fact that a Dominant lies under its Tonic. **Ex. 98.**



I have said that the essence of an interval lies in the melody of a step. From the above analysis it becomes plain that the melody of a step is not appreciable unless the two tones of an interval are thought as keyklangs. Take the step from C up to E in the several keys indicated below, and introspection will show how the melody of this step varies in each key. **Ex. 99.**

C — E

- 1 — o. 3 in C.
- u. 4 — u. 2 in F.
- o. 4 — o. 6 in G.
- o. 3 \sharp — o. 5 in A.
- o. 3 — o. 5 \sharp in A \flat .
- o. 2 — o. 4 \sharp in B \flat .
- o. 2 \sharp — o. 4 in B.
- u. 2 — o. 2 \sharp in D \flat .
- u. 2 \sharp — o. 2 in D.
- u. 3 \sharp — 1 in E, etc.

This perfect conception of tones as keyklangs amounts to a concrete and exact knowledge and appreciation of the relations of tones, and the musical child and adult can learn to think, hear, sing or hum, read and write, the keyklangs with positive certainty and without the aid of any instrument. The scale-half and the Septonate place this accomplishment within the reach of any child or adult of any degree of musical endowment. The certainty and readiness with which the average child can learn the keyklangs may be judged by what I have accomplished over and over again

tion of keyklangs as that of words, colors, and objects. As the melody of a step from one keyklang to another is characteristic of every interval, this melody becomes impressed on the mind of the student, so that he is trained to hear it or recognize it with the same automatism. Briefly, the student gets so that he recognizes keyklangs, intervals, and chords without stopping to think about them.

The musician with an educated ear may say that he can pitch any keyklang he chooses without thinking about its relation to other tones. This is evidence of a perfected mental habit that recollects and anticipates the exact klang of a Tonic, of an over or under Dominant, and so on ; therefore he can produce these klangs in thought and voice at will. This is the end to which proper exercise will develop every student, but the end must not be confounded with the means to its accomplishment. The fact that the musician can produce a Tonic or any other keyklang proves that he recollects the particular relation and that at one time he must have exercised his mind in slowly and deliberately establishing such a particular relation. It would therefore be absurd to believe that a student can acquire the same habit by any other process. However, the student may acquire the habit much sooner than the average musician has by the direct methods just illustrated, inasmuch as these methods at once make it a business to intellectualize the intuitions, while other methods leave this to individual chance-observation. Again, although the educated musician may seem to hear a chord as a unit, he developed this habit through careful and repeated observations of the several voices in the chord. For all practical purposes, we may say that we hear a chord all at once ; but psychologically speaking this is not the case, for the mind hears such a coincidence of several tones as a succession, but passes from one tone to another in such an infinitesimally short space of time as to make the illusion that we hear all the voices in a chord at the same moment complete.

Intervals are read from left to right and vertically: from left to right, in the steps of a single voice ; vertically, in computing the distances between one voice and another in one and the same chord. In the former process the student gains a clear idea of the musical character of the voice ; in the latter process the current of musical thought is directly intercepted and the process is purely mechanical, for progression being arrested, the mind is at a standstill over the contemplation of a single chord. Unfortunately this

mere computation of the length of distances apart from musical thought and key-relation is the training that the average student of Harmony receives. A series of chords, which in reality represents the co-progression of several voices, the average student regards as a series of visual images which are connected by adherence to innumerable precepts. Each such chord is a bunch of notes to his mind and nothing more ; he reads one such bunch up and down, and this renders it a stationary mass ; he proceeds to connect this stationary bunch to another similar one without any relation to its sound, without anything like a concrete idea of the co-progression of several voices : in short, his musical mind and ear are sealed unless he goes to an instrument ; and so he goes on by rule until the series of bunches is completed. This is called studying Harmony and becoming enlightened in the mysteries of the tone-art. Under such circumstances it is not surprising that Moritz Hauptmann, while adding the terminal bar-lines which his pupil had omitted at the end of such a series of bunches, deliberately remarked : "Now we will close up the pig-pen." We do not blame the students for these "pig-pens," indeed it would be unreasonable to expect anything better. The prevalent fallacy of requiring students to grapple with four-voiced harmony at the outset has already been commented on in these pages. It being impossible for the average student to meet this unreasonable requirement, the wonder is, not that so many become helplessly confused, but that so many pull through the study of Harmony with heads clear enough to engage in Counterpoint, *a study with which the student should begin and from which he should derive his earliest intelligence of harmony*. The melodic phrase being the common innate form of tone-thinking, it stands to reason that the student should first gain a concrete knowledge of one-voiced melody with which he is bountifully provided by nature, his predilection to music having first manifested itself in a love of melody. As every melodic phrase gives rise to a concomitant harmony in the mind, this exercise in thinking and writing melodies will as a matter of course soon qualify the student to discover what the harmony is. Thus out of himself and in accordance with the natural process of development he can then counterpoint with a second voice, whereupon a third and then a fourth may be added, and so on. This is the only way by which a student can ever acquire a genuine appreciation of harmony ; indeed, this is the very way in which harmony itself was evolved. Rhythm, measure, and *tempo*, being inseparable

from such a melo-harmonic phrase, all exercises should be conceived in their proper rhythm, measure, and *tempo*. All the earliest efforts of students should be confined to simple dual and simple triple rhythm and measure as well as to simple periods and not, as is common, to compound dual measure and to a rhythmless, phraseless, and meaningless string of chords. Inasmuch as rhythmical accents determine harmony, a principle which will be further elaborated in the ensuing chapters, the importance to the student of a clear conception of the rhythm of his phrases is obvious; *for the more emphatically he thinks rhythmical accents the more distinctly will he perceive the harmony thus generated*. If the work of a student is to have any educational and æsthetic value, every piece of work that he places before the judicial eye of his master *should have a positive musical content*, and this means that it should embody something positive in melody, in harmony, and in rhythm, *the composite of which is a musical idea*. For this reason the simplest bit of writing cannot be conceived apart from its expression: dynamics should therefore never be omitted from a pupil's exercise, and this necessity will prove itself when we come to consider the important part that dynamics plays in regulating the current of co-progressing voices. Examine the text-books on Harmony, and you will look in vain among the exercises for anything like a positive musical content or idea as just described. Indeed, you find a long list of given basses with figures, all of which no one would be so unique as to mistake for musical ideas or for inciting stimuli to the exercise of the nascent musical faculties in the young student's head and heart.

The elimination of so-called *inversions* greatly simplifies the study of intervals and chords. For the same reasons that every tone in the System is individual and immutable, intervals and chords come under the same generalization. The melodies of all intervals differ in klang and so do the harmonies of all chords. Tones *occur* in such and such relations, the relative positions of tones *are* so and so, one tone lies over or under another, and the number that corresponds with the length of a step, together with such exact qualifications as major, minor, augmented, and diminished, accurately describes every interval. The student learns to know exactly where an interval occurs, be it in a scale-half, in a Septonate, in a keygroup, in an over or under scale; just so he learns the exact positions of every chord: all these incidents he conceives as key-incidents, or as combinations of keyklangs.

A prime can no more be converted or inverted into an octave than the figure 1 can be turned into the figure 8. To invert anything is to change the relations of things by turning them upside down, however it does not mean *to change the things themselves*: this is what is done in musical theory by the familiar formula :

1	2	3	4	5	6	7	8
8	7	6	5	4	3	2	1

A 4th is supposed to become a 5th by inversion, but it does not. F *over* C is a 4th, F *under* C is a 5th; the upper and lower F's are two distinct tones, the two steps are two distinct melodies, the one is by no means the other turned upside down.

A tone being individual cannot be changed, and therefore *inverted tones are inconceivable*. Chords are still less invertible, were such a thing possible. The chords of the Sixth and Sixth-and-Fourth are commonly known as the 2d and 3d positions and as the 1st and 2d inversions of a triad; yet these chords do not even contain the individual root of the triad. See below: **Ex. 100.**



These three chords are three individual chords, and each has a different fundamental tone, or ground-tone. The root C of the first chord lies an octave lower than the root C of the second and third chords. These two roots represent two individual tones of the System and cannot be confounded with one another. Thus the process of inversion as applied to intervals and chords is illogical and useless; it creates much serious and unnecessary confusion in the student's mind; no such confusion arises when inversions are completely dropped in teaching music, a fact which long experience has fully verified; the student knows exactly what is meant when the positions of intervals and chords are accurately described as central, over, and under, and he understands each interval and chord perfectly because he conceives every tone in music as a keyklang and every step and combination as a step from one keyklang to another and as a combination of keyklangs: his work is concrete and not abstract. There is a difference between the fundamental tone, or ground-tone, and the *root* of a chord: this difference and its consequence on the classification of the positions

of chords as well as on our conception of chords will be considered in the next chapter.

The terms *position* and *occurrence* answer all purposes for the description of any tone, interval, and chord, in the System. Every tone is a keyklang, and my pupil is able to produce any keyklang mentally, and therefore can in the same manner produce any step from one keyklang to another or any combination of keyklangs. He learns that the position of an interval or chord is this or that, and there is absolutely no confusion. **Ex. 101.**



The pupil describes the above intervals simply as follows :

E lies a third *over* C and a sixth *under* C :

F lies a fourth *over* C and a fifth *under* C :

D lies a second *over* C and a seventh *under* C.

The perfect prime being neither over nor under must be described as **CENTRAL**. The pupil that learns his intervals by the melodies of steps and that recollects each interval by its particular melody also learns and recalls the perfect prime, which is a repetition of one and the same keyklang, by its characteristic melody. Thus the positions of intervals are *central*, *over*, and *under*.

Middle C being the central tone of the System, the Septonate of C being the central Septonate of the System, and the key of C being the central key of the System, the study of music is begun with this central Septonate of the key of C. In the preceding chapter it was shown how the student masters the System of keyklangs by setting out with the under scale-half, which rises to the center; and then by adding an over scale-half, which falls to the center. While learning the keyklangs and stepping from one to another, the student learns intervals. He stands at the center of the Septonate (see Chapter III. Fig. 2) and thinks up or down for the three over and the three under keyklangs with surprising ease and certainty, as evidenced by his vocal recitation of any step that I call for. Because all these intervals or melodies start at the Tonic-center, I call them Tonic-intervals to distinguish them from those that start with other keyklangs.

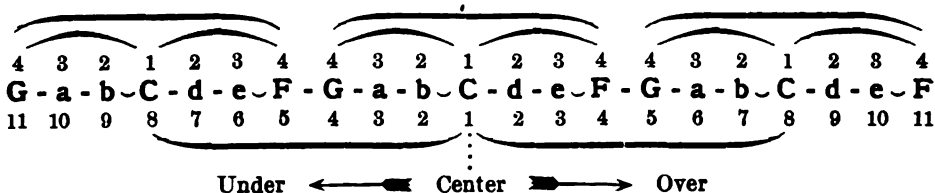
The Tonic-intervals of the central Septonate of C are as follows :

Ex. 102.



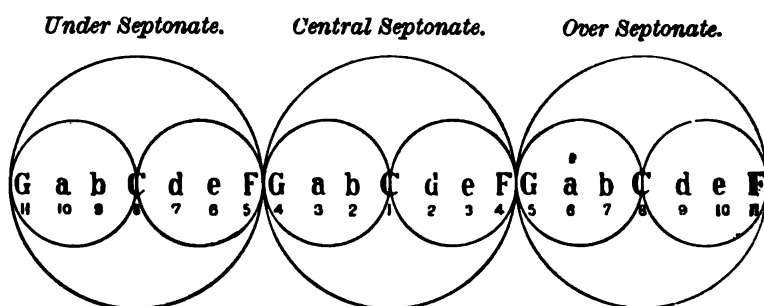
Here the student observes that the prime, the o. 4th, and the u. 4th are perfect, or pure, intervals ; that the o. 2d and o. 3d are major, or large ; and that the u. 2d and u. 3d are minor, or small. The practical value to the development of the student of the facts that combinations of Tonic-centers, of Tonics and over-Dominants, and of Tonics and under-Dominants are always pure harmonies and steps ; that combinations of a Tonic with *all principals* that lie **OVER** are major, or bright, harmonies and steps ; and that combinations of a Tonic with *all principals* that lie **UNDER** are minor, or dark, harmonies and steps, will impress itself still more forcibly in later stages of our subject.

The following example will show how scale-halves are added both over and under the central Septonate and will therefore illustrate how the student gradually gains control over all combinations of principals with the main Tonic-center. By the addition above and below of another scale-half, the natural over and under scales arise ; by adding yet another scale-half above and below, the three Septonates of the *large keygroup* are presented in full. Thus the large keygroup has its central, its over, and its under Septonate. All steps within one Septonate are Septonal intervals and incidents ; all steps from one Septonate to another are inter-Septonal intervals and incidents. **Ex. 103.**



The upper curved lines in this example mark off the three Septonates with their six scale-halves ; the lower lines mark off the natural over and under scales in their progress from one Septonal center to another. The upper row of numbers are Septonal, as they indicate the keyklangs and intervals in their relation to each

Septonal center; the numbers below indicate the keyklangs and intervals of three Septonates in their relation to the center of the central Septonate. Here the student readily appreciates that the o. 5th, o. 6th, o. 7th, and octave of the over-scale are identical with the u. 4th, u. 3d, u. 2d, and Tonic-center of the upper Septonate; and that the u. 5th, u. 6th, u. 7th, and octave of the under-scale are identical with the o. 4th, o. 3d, o. 2d, and Tonic-center of the lower Septonate: again, he understands that the o. 9th, o. 10th, and o. 11th are equivalent to the Septonal o. 2d, o. 3d, and o. 4th; and that the u. 9th, u. 10th, and u. 11th are identical with the Septonal u. 2d, u. 3d, and u. 4th. All this will appear more clearly in the following Septonal circles. **Fig. 6.**



From the center of the central Septonate the student of keyklangs gains a perfect command over the scale-half, Septonate, and scale: he knows exactly in what scale-half, Septonate, and scale each tone occurs, and therefore understands its exact position, and, what is most important, he can think these twenty-one tones in any order of sequence that he may choose, always knowing where he starts, where he goes, and where he stops; he learns to do all this with as much ease and automatism as he would run through the letters of the alphabet. How important it is to reach this automatic stage in intervals every music instructor knows. How few students learn thus to hear without stopping to think is also well known by instructors. Unless a student perfectly masters intervals he will have a severe struggle and will find it discouraging up-hill work when he comes to grapple with Counterpoint and Harmony. The pupil that does not know and cannot hear his keyklangs simply does not know the musical alphabet and is tone-deaf. The color-blind might just as well attempt to paint as the tone-deaf to study the language of music. There are no cases in which the color-blind have aspired to paint or to become great artists, yet the tone-

deaf are struggling with music by the thousands and there are plenty that aspire to artistic fame. The heaviness of music theory for the average student and the great difficulty of comprehending it, which increases at every forward step, are attributable to a lack of proficiency in intervals. Let every pupil therefore learn the keyklangs and their pure and beautiful melodies !

Before proceeding with a complete list of the Tonic-intervals, I desire to call the musician's attention to other intervals which abound in music and which have already been alluded to in preceding chapters. These hitherto overlooked intervals have already been named as follows :

Under-Dominant intervals.

Over-Dominant intervals.

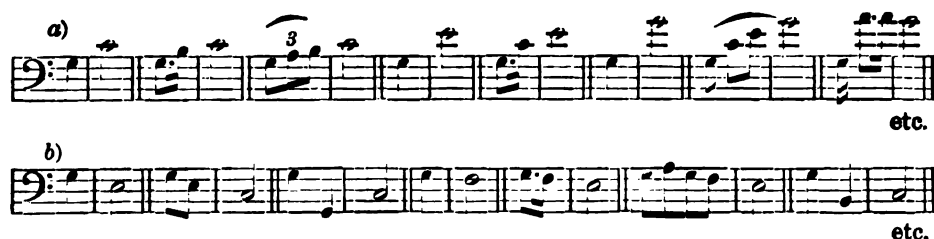
Under-3d intervals.

Over-3d intervals.

Under-2d intervals.

Over-2d intervals.

The most frequent of all intervals in music are the under-Dominant intervals, or in other words, those steps that start with the under-Dominant. A few examples will be sufficient to illustrate this fact. Set out with any one of the following familiar under-Dominant steps, and each one will suggest any quantity of familiar phrases all the way from Bach to Wagner. **Ex. 104.**



klangs and scale-halves makes an early acquaintance with the commonest steps from the under-Dominant, as he begins his studies with the under scale-half and forms his earliest conception of a Tonic through the medium of the under-Dominant. Again, because of the great frequency of these intervals in music and because of their consequent great familiarity, they are the quickest and easiest to learn and master. When my pupil sings the interval that I call for and can tell me what the interval is that I sing or play, then I know that he can hear. This is the only sure test of intelligent hearing.

The point of greatest moment in this connection may be given briefly. It is this: to conceive an interval by computing the distance from one tone to another is one thing, but to conceive an interval as a step from one keyklang to another is a very different thing. In the latter case we know and feel exactly with which keyklang we start and to which keyklang we move. Every musician will appreciate the fact that it makes a vast difference in the klang-character of a step, say a major o. 3d, whether we start on 1, on o. 2, on o. 3, on o. 4, on u. 2, on u. 3, or on u. 4. This point clearly demonstrates the importance of the keyklang, or the tone that is relationed in a key.

A few steps from the over-Dominant will demonstrate the necessity for exercise in over-Dominant intervals. **Ex. 105.**



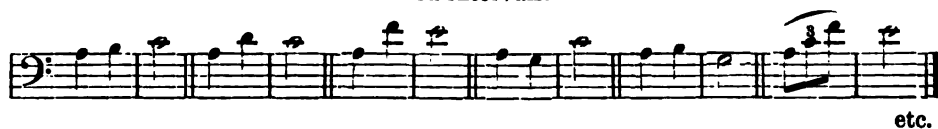
Very familiar are those steps that start with the o. 3d, or bright third. A few are given here. **Ex. 106.**

o. 3d intervals.



Next in order are the steps that start with the u. 3d, or dark third. **Ex. 107.**

u. 3d intervals.



A few examples of o. 2d and u. 2d intervals may now follow.

Ex. 108.

o. 2d intervals.



u. 2d intervals.



According to current methods the student of Harmony writes out only the Tonic-intervals in *one* key, and this key is usually C. Inasmuch as the average student knows intervals by sight only and not by ear, as he is not required to or rather not compelled to produce Tone-relationships mentally, even Tonic-intervals as they are usually practiced in writing do him but little good, and this good amounts to little more than qualifying him to recognize intervals on black and white. Again, while he may thus recognize all intervals that start with C without much difficulty, those steps that start on other klangs in the key of C and on the keyklangs of other. keys cause him to stop to think, unfortunately not of the *melody* of a step but of the *length* of a step. Thus the student is busy with notes and not with the melodies of the intervals which the notes represent. The uselessness and absurdity of such a method of studying music is too obvious to need more than passing mention. The student of my System gains a concrete knowledge of keyklangs, and as the relations of keyklangs in one key are alike in all keys, the eye can easily be trained in the visual appearance of these relations in all keys ; and whatever this relation may be, the sight of an interval or chord revives its exact sound or klang in the mind. Thus the pupil *hears* what he sees and does not merely *see* : that this is as it should be no one will question. The student of my System therefore reads, writes, sings, and plays what he hears, thinks, and feels.

The steps that follow upon starting with the six keyklangs as presented and suggested in the above five examples demonstrate

the absolute necessity for their mental practice, on the simple ground that a student must be able to start with any keyklang and must always know exactly to which keyklang he progresses and on which keyklang he stops. Just as he must acquire the habit of doing all this with the principal keyklangs, just so must he develop the habit of starting with any of the ten primary intermediates and thus gain control of the small and the large key-groups. As space does not permit me to give more than an approximate idea of my methods of teaching, it is unnecessary to add examples similar to those above in which steps are taken from the intermediates. These intermediates are not introduced into my classes until the principals have been mastered in a most efficient manner. All writing is done in one voice during this stage: the Principle of Progression is explained and practically applied to the phrases and periods of melodies in simple song and dance forms: these phrases and periods are carefully analyzed into harmonics and bytones, and this leads to an analysis of rhythm and a concrete acquaintance with the relations of rhythmical accents to harmony: this leads to a classification of bytones as simple, passing, and changing tones. The terms *passing* and *changing* in relation to bytones are used here because they are familiar and not because they are proper, for tones neither *move* nor *change*. It is on this track of the principals that the pupil learns what purity and virility of style mean, and through the medium of rhythmical ideas he learns how inexhaustible are the melodies that lie hidden in these principals. It is on this track that we find the songs and dances of folk and nations as well as the noblest and grandest ideas of Bach, Gluck, Mozart, Beethoven. Deflections from this track in the over-use of intermediate passing-tones and harmonies result in an enervating and a sickly expression, which are as obnoxious to a healthy musical mind as is the Händelian and English mania for over-ornamentation. That modulations from one key to another may be effected by means of principals alone will be seen when we consider the subject of Modulation in the concluding chapter.

The mental effect of a keyklang and the knowledge of the exact situation of each keyklang are of primal importance, as the former generates the exact melody and harmony of a step and the latter renders the computation of the length of a step very simple. Thus the student of my System *hears first* and *computes last*; while in current methods this is just the reverse, inasmuch as the length

of the interval is *first measured* as a means of forming a conception of the klang of the interval, if such a conception be formed at all; or briefly, the student of current methods *computes first* and *hears last*, if he hears at all. In either case the end is to hear the keyklangs and the melody of the step, and the advantage of the keyklang System is that the calculation of distances is of secondary importance and serves only as a means for accurate description. When a student says that he steps from u. 4 to o. 4, he knows the keyklangs, and the step is properly and intelligently described: that the length of this step is a seventh and moreover a minor seventh is not difficult for him to observe and remember. But what is of greater moment, he observes the exact effect of this key-relation and that no other minor seventh in the key is exactly like it. What is true in this connection of the interval in question is true of all intervals.

Thus the pupil readily develops the habit of observing and associating the melodies of keyklangs with the numbers answering to their respective lengths of steps. The intervals that arise by alternating the steps of the two scale-halves result in odd numbers in the Septonate and in even numbers in the scale. These intervals are recommended for mental practice; they are as follows: **Ex. 109.**

SEPTONATE.

SCALE.

These exercises prepare a student for combining two voices on the scale-halves, and although the student's mind is bent on the progression of the voices, he cannot escape observing the intervals of the resulting two-voiced harmony. **Ex. 110.**

SEPTONATE. SCALE.

The following examples will illustrate the ease with which a student can transpose a scale-half from one Septonal stratum to another and thus learn all intervals both Septonal and inter-Septonal, the scale-half being the surest possible guide, as it is a simple matter to skip with an entire scale-half from one octave or stratum to another. **Ex. III.**

UNDER SCALE-HALF.



OVER SCALE-HALF.



The intervals of steps and combinations that occur in still higher and lower strata or octaves are also classed as inter-Septonal and are numbered like the above. **Ex. II2.**

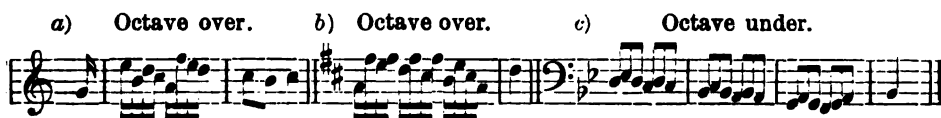
UNDER SCALE-HALF.



OVER SCALE-HALF.



Although all the above examples are presented as starting in the central Septonate of C, it is hardly necessary to explain that my pupil writes his phrases and melodies in any octave or stratum and in any key he may choose. Thus examples like the following he would describe as occurring an octave over or under the central stratum. **Ex. II3.**



It is an interesting as well as an important fact that the most melodious intervals in music, and therefore the intervals that are most frequently employed in composition, *are the steps from one keyklang to another in the SEPTONATE and are NOT the steps from one keyklang to another in the SCALE.* Briefly, *the most melodious intervals occur in the Septonate and not in the scale.* The preceding examples furnish illustrations of this fact. This important point may be made more explicit as follows: the *Septonal* steps from any one of the keyklangs of the under scale-half to any one of the keyklangs of the over scale-half and *vice versa* are the most common and the most agreeable successions of the seven principal keyklangs: it is almost superfluous to state that these steps do not exist in the scale of seven keyklangs, for this scale presents another arrangement of the order of the keyklangs; it presents the Tonic as a lower extremity and, as has been shown previously, this scale is an imperfect unit.

Some Observations on Voice Culture.

Within the limits of a Septonate the most charming and instructive exercises may be written. The Tonic-center and the remaining keyklangs lie so close together that such *Septonal* exercises are calculated to cultivate the ear with expeditiousness and certainty. The mental effects of keyklangs and the mental effects of steps from one keyklang to another, if mastered early, will render later complex problems in Counterpoint and Harmony appreciable and simple, comparatively speaking, and such mental exercises are alike important to every student, whatever may be his branch of musical study.

Owing to the obvious advantages of the scale-half and the Septonate to the vocal student, a few remarks on voice culture will not be out of place here. Vocal exercises in scale-halves and Septonates can be made very delightful as well as instructive and might be substituted for the dry, uninteresting, and often unmusical and monotonous exercises that abound in most voice methods. The mental effect of a keyklang furnishes the vocal student with a concrete and vivid experience of the relation in which a tone occurs, and apart from such a distinct conception it is

a psycho-physiological impossibility to produce a perfect tone. No mechanical act can be co-ordinated unless we know what we want to do, and without a perfect conception of a keyklang the vocal student *does not know what* he wants to do. Action under such circumstances means embarrassment and contortion of some degree.

All perfected mechanical acts may be generalized under the one head of complete or perfect Anticipation, a principle which has already received some attention in the preceding pages. The perfect mechanical act is perfectly anticipated: the mind anticipates or feels exactly *what* is wanted, the nerves and muscles anticipate or feel exactly *how* to produce what is wanted, the efferent nerve currents that accompany the will in action are uninterrupted, and co-ordination is perfect. In the reverse case, when anticipation is imperfect, there arises a conflict of efferent and afferent nerve currents; or in familiar language, we want to and yet we do not want to act, and the result is hesitation, embarrassment, stammering, and contortion, in degrees proportionate to corresponding degrees of mental and physical states. All embarrassment in speech, song, piano-playing, in short, in all mechanical acts, is nothing but nervo-muscular stammering, and all such physical stammering springs from mental stammering. Perfect anticipation, both mental and physical, freedom, confidence, and courage bespeak the mastery of acts, be they simple or complex: imperfect anticipation, restraint, fear, and nervous stammering are the unmistakable signs of non-mastery. When you know what to do and how to do it, do it with the courage and confidence of a master; then you are a master of the particular step just taken; keep this up in every succeeding step, or you will never overcome mediocrity: these and similar other maxims have had a salutary and in some cases a wonderful effect on my pupils.

This Principle of Anticipation has been analyzed by me in a separate essay: its brief presentation here will answer the present purpose, for no singer can produce a tone without the mental effect of its relation as a keyklang. Not being able to conceive a tone in this way, the average vocal student is compelled to resort to a piano and to depend on his intuitive perception of the relations of tones, or sing an entire scale before he can find the particular interval he desires to start with. Where there is a good and true natural ear, the intuitions will help a student to perceive the *simplest* relations of tones, but beyond this, mere intuition ceases to guide a student and he sings out of tune.

The scale of eight tones, on which the voice is trained, is too complex a unit for the beginner to control *in toto*; its compass is too great for the delicate process of voice culture, for it carries the voice both too high and too low and is therefore calculated to strain the organ. This difficulty is immediately removed by employing the scale-half of four tones; and as the scale is divisible into two such halves, both of which are constituted precisely alike, the transition later on from the scale-half to the scale is not difficult. When one scale-half has been properly learned, others can be added both over and under with ease and security, and the voice is thus extended in either direction. As the scale-half cultivates the sense of keyklangs and the sense of progression from keyklang to keyklang within the range of four tones, it is the proper unit with which voice culture should begin.

The sense of progression is not acute unless the harmonic relations of the keyklangs in a phrase are perceived, and much impure intonation is due to a general lack of this sense. Next to this cause of impure intonation comes the one that springs directly from the non-perception of rhythmical accents, which accents, as we have seen, are so directly concerned with the harmony and therefore with the conception of such a series of tones. This roughly explains the commonness of the phenomenon of singing out of tune, and the great rarity of a pure singer fully justifies the extraordinary public enthusiasm over our few great vocal artists. It is no exaggeration to say that ninety-nine out of every one hundred vocalists sing out of tune. Most errors in musical expression that are committed by soloists, choruses, and orchestras are due to an insufficient knowledge of and training in the harmonic and rhythmic Principle of Progression, and thus the sense of progression is left almost entirely in an intuitive state. Section-rhythms and phrase-rhythms and their respective generating accents are not practiced, and this is why correct and pure phrasing is so rare, for the impulse of the phrase is its rhythmical accent. The singer that is brought up on keyklangs and on the Principle of Progression by way of the scale-half and the Septonate is bound to understand Progression perfectly, inasmuch as the scale-half and Septonate are the indexes of natural progressions; as he makes an early acquaintance with the inter-relations of melody, harmony, and rhythm, he learns what phrasing and phrase-Progression mean. A perfect expression of music is possible only when the sense of progression from phrase to phrase is perfect, and

may be called a Tonic, inasmuch as every person's voice is in a certain key and therefore rises and falls both over and under a Tonic-center. According to varying degrees of repose and excitation our speaking voices touch the intervals that occur within the limits of one tone-stratum or reach over into higher or lower strata. In extreme joy or anger and in acute pain the pitch of the speaking voice far exceeds that of the singing voice: this observation is directly the reverse of what is generally believed. In his essay on "The Origin and Function of Music" Mr. Spencer details many interesting observations on the inter-relations of emotional states and pitch of voice. The subject is an interesting one and merits more space than can be given to it here. The keys in which different individuals speak vary, and in conversation the key of one person is greatly influenced by that of another: during moments of agreement in opinions, voices are attracted into one and the same key and harmonize; during moments of disagreement, the keys change, and voices become discordant in proportion to the intensity of the feelings that are provoked at such moments. Persons are sometimes abashed by the sudden consciousness that they are mimicking the key and vocal inflections of their polite visitor with perfect fidelity and impolite accuracy.

The most frequent intervals in speech are up and down fourths, fifths, and octaves. Pure speech, however, is so unusual an accomplishment that all analyses of the melody of speech (many such analyses are extant) are apt to strike us on first observation as being unnatural and often absurd. The reason why we find it difficult to hear in speech anything akin to melody is not only because vowel sounds are cut short but also because the pitch of the voice is generally raised or lowered on one and the same vowel.

What are the benefits to be derived from music instruction in schools! Judging from what is accomplished in this department in schools it would be difficult to discern any benefits whatever. Such instruction would have a highly salutary purpose, were children trained in the pure emission of vowels and in the distinct articulation of consonants, for consonants are in fact the *muscle* of the voice. Such training would eventually help toward producing an appreciable diminution in harsh, squeaky, nasal, guttural, dental, and gummy voices, all of which abound especially in this country of mixed nationalities and tongues. By such simple means as the scale-half and the Septonate every child in public and private schools could gain a perfect mastery of the key and keyklangs,

and these same means might be employed with good results even in the kindergarten.

Probably nowhere has the relation of song and speech been so minutely and carefully analyzed as in the remarkable work on German vocal art by Julius Hey. No vocal teacher or elocutionist can afford to omit a careful study of Mr. Hey's ideas and methods.

It is worth a moment's digression to mention that Mr. Spencer, in the above alluded to essay, entirely overlooks the necessary implication of rhythm and rhythmical accentuations in his hypotheses regarding the genesis and expressiveness of music. This is the more interesting when we consider that the principle of rhythm is consistently carried through his entire Synthetic Philosophy. Beyond pointing out the natural tendency of persons to beat "time" and to march and dance in response to stimulating rhythms, this greatest of generalizers has nothing to say about musical rhythms. In the same essay the writer is puzzled to know why during intense pain and pleasure it is natural to sway the body to and fro rhythmically. Does not the sensation of keeping the balance explain all the phenomena in bodily movements! *Every movement is started by an accent, is kept up by repeated accents, and ceases when accent ceases; is rhythmical when accents are regular and is angular and jerky when accents are irregular.*

Another instance in which Mr. Spencer does not mention the direct implication of the principle of rhythm may be found in his essay on "The Philosophy of Style." In this essay, cases in which we select long Latin words in preference to short Anglo-Saxon words for the sake of greater expressiveness are explained on the ground that the Latin words are more mouth-filling and therefore render the voice more emphatic and impressive. As rhythm is so pronounced a factor in speech and gesture, it is obvious that our rhythmical habit prompts us to choose the Latin word in such cases in order to place the accentuated syllable at a point where it will unite with a rhythmical accent. It is safe to say that we choose a word the accented syllable of which will be coincident with a rhythmical accent, and this word may be either Latin or Anglo-Saxon, according to the number and succession of syllables in the spoken clause. The dynamics and rhythms of speech afford an interesting field for psychological analysis.

Enough has been said here on the subject of speech-tonality to show its analogy to my view of the Tonal System. The voice has a key; a medium or central tone, which is a point of repose; it has

over and under tones, and over and under strata. The rhythms of speech are identical with the rhythms of music. In musical expression we wait a moment before an accented syllable or tone: this is equivalent to the frequent accents in speech in which we delay the emission of a syllable during the moment that we get breath and muscle for a distinct consonant by which to project the syllable. In music we lengthen tones that are more expressive than others just as we lengthen syllables when we wish to impress our speeches. These parallelisms might be extended indefinitely.

The process of voice-building being a very delicate one, it is a very dangerous one for the student who is in the hands of an inefficient teacher. Under certain circumstances the singing voice can be utterly wrecked and the speaking voice can be permanently injured. Every thorough teacher of the voice will unhesitatingly subscribe to these facts. Voice-straining is as common as it is flagrant. Let every vocal student be on his guard if he grows hoarse after practicing. This is the unmistakable symptom of incorrect practice and usually of an incompetent teacher; if such practice is continued too long it means the wrecking of what might have been a good voice; it means more, for in this way the foundation is laid for many throat diseases.

The dangers of voice-straining are greatly diminished by employing the model medium tone and the scale-half at the start. The model medium tone is the easiest to touch and the scale-half is within easy reach of the physical voice of any beginner; more than this, every beginner can fully appreciate the harmonic and melodic completeness of a scale-half. With this perfect conception of keyklangs the physical voice is unembarrassed in their production, for in the absence of such a perfect conception mechanical production is always embarrassed. Hence the development of the mental instrument as set forth in these pages is essential to the cultivation of pure vocal tone-production. The voice can gradually be extended by practicing scale-halves whose Tonics are side by side. As no mechanical act is perfectly discriminated apart from rhythmical accents and as vocal tone-production is such a mechanical act, it is obvious that unless a singer has a clear conception and a true sense of rhythmical accents his physical voice is embarrassed, and it is unnecessary to add that any degree of such embarrassment impairs the tone. Perfect and spontaneous mechanical production is accompanied by a steady and uninterrupted efferent nerve current.

Passing mention may be made here of the voice methods that require beginners to practice on the detached vowels *ä*, *ō*, and *u*. This fallacious practice, though not universal, is comparatively common. To pitch a pure tone on an isolated vowel is, to use a familiar phrase, the hardest thing to do in singing, and should therefore never be required of a beginner. Moreover, this practice is directly opposed to physiological principles. The first and most subtle difficulty with which the singing-master has to contend is to bring *forward* the voice of his pupil, a thing that cannot be done on a separate vowel unless the model tone is unusually perfect. The consonant has already been spoken of as the muscle of the voice, and this muscle is what a beginner needs for the purpose of locating and throwing forward a vowel, or tone. To the first syllable of words that are to be sung with great power and that begin with a vowel singers not infrequently prefix the letter *h*: again, to syllables consisting of a single vowel that are to be sung with power and emotion an *h* is prefixed and an *r* is suffixed for the power and emotion respectively. At a presentation of the opera "Hamlet" I heard the Court Baritone passionately address Ophelia by the strange distortion "*Hor-r-rphelia!*" Many other illustrations might be given of instances where singers intuitively or consciously add consonants, or muscle, to their vocal discourse.

Declamation is the essential factor in training pure and musical utterance; locate consonants and vowels down in the throat and the voice is throaty, direct them through the nose and the voice is nasal, and so on through the entire category of voice impurities, all of which applies to speech as well as to song. Produce consonants and vowels well forward in the mouth, and without resistance let the vowel part the lips and shape them for its passage; this will always result in a musical tone. If the consonant is brought forward the vowel is brought forward, or in a word, the location of the consonant determines the location of the vowel; *thus the consonant locates the tone*. Mozart writes over one of his songs, "To be sung a little through the nose": if the vocalist will locate the consonants in the nasal cavities he can without difficulty meet this unique and droll requirement of the great master.

The consonant being the muscle of the voice, it is the nervo-muscular accent on which we depend for an exact localization and clear emission of a tone; the consonant is therefore of the greatest significance in vocal tone-building, and during the early stages of

voice-training such consonants should be employed as best minister to a pure emission of the various vowel sounds.

Pure speaking is the direct road to pure singing and is the sure test of a good singer. We are or rather we should be surprised when persons tell us in a throaty or nasal tone that they are singers, yet the largest number of singers speak impurely. It is a pity that so little attention is paid to pure speech during a child's early education; this should be begun at home and at the kindergarten.

The causes of sharpening and flattening in singing are due in the main to a bad ear or ignorance of tone-relationships and to that necessary evil, Temperament. In this connection I will stop to mention and explain but one of many difficulties to which my attention has frequently been called. The point in question is this: Why do beginners sing the ascending scale with so much more ease and purity than the descending scale? Even though they do not sharpen in ascending, they tend to flat badly in descending. Apart from the natural ear and from Temperament, there is a physiological explanation of this phenomenon. While ascending on the scale there is a gradual contraction of the muscles of the vocal apparatus, in other words, there is a gradual *crescendo* in pressure; in descending, on the other hand, there is a corresponding gradual relaxation of the muscles, or a gradual *decrescendo* in pressure. It is easy and natural for any one to make a slow and gradual *crescendo* in pressure, but it is extremely difficult to reverse the process by starting with a strong pressure and gradually and slowly relaxing the muscles. Gradually increase the pressure, say with the hands or feet, gradually close the eyes or lips tighter and tighter, and in all of these acts the concomitant current of nervo-muscular energy runs perfectly smooth; reverse the process, and gradual relaxation is accompanied by a series of slight jerks until pressure ceases. Just as natural as it is to contract the muscles gradually, just so natural it is to relax them suddenly, and this natural desire to relax suddenly accounts for the common tendency in vocal novices to flat on a descending scale. The only regulator of a gradual relaxation of the muscles of the voice is the mind's ear. A distinct conception of the pitch and of the relationships of tones is the only sure means of removing the evil of sharpening and flattening.

The action of the lungs in this connection is very similar. We can easily fill the lungs gradually and slowly, and the current of air is inhaled smoothly: however when we attempt to expel the air slowly, it comes in successive gusts which correspond to and

coalesce with the successive jerks that accompany the relaxation of the muscles. Upon a long breath it is natural to expel the air quickly. The probable explanation of the jerks that accompany muscular relaxation is this: during a *crescendo* in pressure the tissues are gradually wasted and the muscular energy becomes exhausted, while during relaxation the tissues and therefore the energy undergo repair: thus by the time we pass from *crescendo* to *decrescendo* there is not sufficient energy left to enable us to regulate a gradual relaxation of the muscles.

So far as the scale-half and Septonate are concerned in providing a safe basis on which to train the singer to an intelligent conception of the relations of tones, they do not entirely set aside the dangers of impure intonation, there being yet another agent in the way. I refer to current methods of developing the vocal bellows. For the common custom of requiring beginners to practice breathing exercises for the purpose of extending the lung-power and getting a large stock of air on hand is radically false. This produces voices under high pressure and the unavoidable consequences are a spasmodic attack, singing sharp, and an over-breathy and whistling tone. The vocal touch of a tone should be as light as the touch of the eye upon a familiar object, and the tone itself should be as bright as the expression of eyes when they meet in recognition. Too much breath is pernicious to such an end. The old Italian methods cannot be improved upon: they represent the methods of nature, and the methods of nature can alone stand the test of psycho-physiological principles. The breath is the natural means to the desired end: a perfect conception of the tone to be sung gives rise to a perfect anticipation of the exact measure of the physical means of its production. This perfectly conceived tone requires no conscious attention to the method of its physical production, providing a singer has been trained properly from the start. A beginner needs no more than his easy natural breath for his early efforts: anything more would be dangerous. Let him begin by vocalizing the natural breath in short and soft tones and let his lung-power be increased directly by a gradual development of greater volume and length of tone. In this way the means will always stand in a subservient relation to the ends, and however involved these ends may be, singers will breathe naturally and not artificially. It is as injurious for beginners to practice long-sustained tones as it is for them to sing too high and too low. But vanity in the pupil and often lack of moral force, ignorance, and

helplessness in the teacher succeed in introducing songs and arias in the music lesson long before the voice is in any sort of condition to practice them and often after a few lessons have been taken.

To whatever part of the body the attention is directed there is an increased flow of blood. Therefore high tones and red throats and faces often go together, not only in uncultured singers but also in such singers as are intent on the methods of artificially using their vocal organs at the expense of purity of tone and of nature.

So long as the singer is not devoid of sensation by which to regulate the vocal apparatus, there seems to be no reason why he should employ a mirror during practice. Of what use is the mirror to him? To *see* whether the tongue is in the proper position; to *see* whether the mouth is open or shut, or drawn to one side; to *see* whether the jaws are drawn in opposite directions; in short, for the purpose of giving the pupil a chance to see whether he is cutting faces and in anyway is violating the code of vocal laws. All this tends to take the singer outside of himself and encourages superficiality. If a singer cannot *feel* the positions of tongue, jaws, and lips he had best let singing alone. The mirror is as superfluous and ridiculous a companion in practicing the voice as was the spoon with which singers pressed down their tongues in years gone by.

No other class of musicians can get on with so little theoretical and technical knowledge of music as singers, and a good voice, a gift of nature, assures a successful career to any one possessing it. This goes far toward accounting for the vanities of this class of musicians and for the farther fact that thorough musicians are extremely rare among them. Owing to the scanty knowledge that the average vocal student desires to acquire in order to gain the applause of indiscriminate listeners as soon as possible, the task of the average singing-teacher is less satisfactory, less interesting, and more superficial than that of any other class of music-teachers. Consummate masters of the art of voice culture are comparatively so few in number that their great prominence and repute, which are world-wide in some cases, are not to be wondered at. If vocalists could be persuaded that they require a perfect knowledge of the relationships of tones for pure and intelligent singing, and if they would set to work at Counterpoint and Harmony for this otherwise unattainable end, the state of things vocal would soon undergo an appreciable change.

Let us hope that the mania for extreme high and low tones may soon become a thing of the past and be substituted by a more

general ambition for good musicianship. Nowadays we are sure to hear the best tones in a singer's voice : the singer sees to this in the selection of his *morceaux*, and by unduly prolonging and swelling his *best* tones whenever they occur. I am reminded here of a singer who told me that there were tones in his voice "so solid and so heavy" that he could "fairly *lean* on them." He sang : alas ! he leaned too heavily and he leaned too long : his "solid" tones broke into sounds which the most generous judge could not have mistaken for intention or emotion.

The Numbers and Letters of Intervals.

In order to read and write fluently the student should learn to associate the letters or notes with the numbers by which intervals are named. For example: the step $\overset{C}{1} - \overset{e}{o.3}$ is always an over third, whether C is ♭, ♯, ×, or ♮, and whether e is ♭, ♯, ♮, or ♯♮, as follows:
Ex. 114.



While the average student can recognize the major or minor thirds in the above example with facility, he is sure to stumble over the other thirds in the same example. However, if he learns at the outset that the letters C and e in this position are *always a third* of some sort, whatever the accompanying signs may be, he will read and write one of the above thirds as readily as another. A student should therefore have a certain amount of mechanical drill in learning to associate the corresponding letters and numbers of all intervals. The tables that I employ for this purpose have proved of great practical service. The work of learning these tables, although it is rather dry, does not require much time ; and once learned, a student gains the necessary mechanical facility, without which he will ever remain a stumbler. We say twice two are four without stopping to think and compute : in the same way the music student should learn to remember the letters and numbers of all intervals.

There are seven such tables, one for each letter of the musical alphabet. The first table is as follows: **Ex. 115.**

Table 1—Letter A.

<i>The Step.</i>	<i>Central.</i>	<i>Over.</i>	<i>Under.</i>
A — a ...	Prime.	Octave.	Octave.
A — b	2d, 9th.	7th.
A — c	3d, 10th.	6th.
A — d	4th, 11th.	5th.
A — e	5th.	4th, 11th.
A — f	6th.	3d, 10th.
A — g	7th.	2d, 9th.

It will be understood that whether naturals, sharps, or flats are added to the letters, the numerical name of the interval remains the same. Of course this remark applies to each line in the above table and to all succeeding tables.

It may also be mentioned here that in teaching I have found it very practical to speak of 9ths, 10ths, and 11ths as *octave-2ds*, *octave-3ds*, and *octave-4ths*: thus, an over ninth is called an *over octave-2d*; an under ninth, an *under octave-2d*, and so on. It is also more convenient to say simply *overs* and *unders* instead of over intervals and under intervals.

The remaining tables need not be given in full, as with the exception of the columns of letters the seven tables are alike. Thus each of the following columns of letters is to be substituted for the column of letters in the above table.

Ex. 116.

Table 2—Letter B.

B — b
B — c
B — d
B — e
B — f
B — g
B — a

Ex. 117.

Table 3—Letter C.

C — c
C — d
C — e
C — f
C — g
C — a
C — b

Ex. 118.

Table 4—Letter D.

D — d
D — e
D — f
D — g
D — a
D — b
D — c

Ex. 119.

Table 5—Letter E.

E — e
E — f
E — g
E — a
E — b
E — c
E — d

Ex. 120.

Table 6—Letter F.

F — f
F — g
F — a
F — b
F — c
F — d
F — e

Ex. 121.

Table 7—Letter G.

G — g
G — a
G — b
G — c
G — d
G — e
G — f

We may now proceed with the classification of the intervals. The *three groups* into which I divide intervals may be considered in their natural order of sequence.

The First Group of Intervals.

This group includes all the PRINCIPALS of the three Septonates in a LARGE KEYGROUP and therefore includes all steps from PRINCIPALS to PRINCIPALS.

All steps within the limits of one Septonate I call *Septonal* steps or intervals; all steps from one Septonate to another I call *inter-Septonal* steps or intervals.

Following are the Tonic-intervals of this group: **Ex. 122.**

	Septonal.				Inter-Septonal.						
	<i>p.</i>	<i>l.</i>	<i>l.</i>	<i>p.</i>	<i>p.</i>	<i>l.</i>	<i>l.</i>	<i>p.</i>	<i>l.</i>	<i>l.</i>	<i>p.</i>
OVERS											
	Prime	2d	3d	4th	5th	6th	7th	8ve	9th	10th	11th
UNDERS											
	<i>p.</i>	<i>s.</i>	<i>s.</i>	<i>p.</i>	<i>p.</i>	<i>s.</i>	<i>s.</i>	<i>p.</i>	<i>s.</i>	<i>s.</i>	<i>p.</i>

The abbreviations in the above example are explained as follows:

1. *p.* indicates *pure* intervals, also known as *perfect*.
2. *l.* indicates *large* intervals, known as *major*; I also call these *bright* (German: *hell*).
3. *s.* indicates *small* or *minor* intervals; I also call these *dark* (German: *dunkel*).

The above intervals may be specified as follows:

1. All *over* and *under* 4ths, 5ths, octaves, and octave-4ths, and the central prime are *pure*.
2. All the remaining *overs* are *large* and *bright*.
3. All the remaining *unders* are *small* and *dark*.

All the above *pure* intervals or steps occur between Tonics and Tonics or between Tonics and Dominants. All *pure* intervals that start with other keyklangs are similar to these in effect. Instead of having to rack his mind with inversions, the student simply learns which intervals are pure, which are bright, and which are dark. The fact that all the above bright steps are *up* and that all the dark ones are *down*, not only simplifies matters but increases the chances of a student's becoming a concrete musician.

In the above group of Tonic-steps attention is called to the double-bar lines which mark off the scale-halves and the over and under scales. The student is ever under the guidance of the scale-halves and therefore always knows the exact situations of the tones that he is relationing: the importance of this accurate knowledge of the relative positions of tones cannot be over-urged.

The first group of intervals shows that in a large keygroup there are twenty-one steps from a Tonic to the other principals. *There being twenty-one principals in a large keygroup and there being twenty-one steps from each of these to the others, there are $21 \times 21 = 441$ steps from principals to principals.*

The essence of an interval was defined as the melody of a step: according to this computation there are exactly *four hundred forty-one* such melodies in the principals of a large keygroup, and these melodies are the most familiar ones in music.

The Second Group of Intervals.

The TEN PRIMARY INTERMEDIATES are included in this group. Hence this group comprises all steps *from PRINCIPALS to PRIMARY INTERMEDIATES, from PRIMARY INTERMEDIATES to PRINCIPALS, and from PRIMARY INTERMEDIATES to PRIMARY INTERMEDIATES, in a large keygroup.*

The Tonic-intervals, or all steps from a central Tonic to the ten primary intermediates, may be given here.

There are two divisions of these intervals, as follows:

1. Those steps that proceed from the central Tonic to the UPMEDIATES.
2. Those steps that proceed from the central Tonic to the DOWNMEDIATES.

Each of these divisions is subdivided into *overs* and *unders*.

In the following examples the abbreviations are too familiar to require explanation. The second group of Tonic-intervals is as follows: **Ex. 123.**

1. Upmediates.

	aug. 1me	aug. 2d	aug. 4th	aug. 5th	aug. 6th	aug. 8ve	aug. 9th	aug. 11th
OVERS								
UNDERS								
	3d dim.	4th dim.	5th dim.	7th dim.	8ve dim.	10th dim.	11th dim.	

2. *Downmediates.*

	s.	s.	dim.	s.	s.	s.	s.
	2d	3d	5th	6th	7th	9th	10th

2d	3d	4th	6th	7th	9th	10th	11th
l.	l.	aug.	l.	l.	l.	l.	aug.

On the ground that tones are individual and cannot be modified by raising or lowering them, the *ten primary intermediates*, which appear in the above examples, must be incorporated into the key-group. In practice this has been done long ago, for in all musical works these five upmediates and five downmediates have been used freely, appearing both in the character of *bytones* and *harmonics* and not necessarily changing the key, or modulating. To state the case more plainly, these upmediates and downmediates do not necessarily change the key even though they are *harmonics*. I shall revert to this fact later on.

The fact that these ten primary intermediates are one and all as individual and unchangeable as the principals themselves; that they are intimately related to the principals nearest over and under them; that in practical music they are employed freely both as harmonics and bytones; that even though they appear as harmonics they do not necessarily modulate outside of a key; that they unite with a Tonic in forming the *minor* or dark mode; moreover, the fact that there are such tones: take these facts singly or collectively, and they prove that these *ten klangs are keyklangs and are part and parcel of the key itself*. Thus these ten keyklangs together with a Septonate constitute the unit which I have named the **SMALL KEYGROUP**. The principals, which constitute a Septonate, are the *primary* keyklangs; the ten primary intermediates are the *secondary* keyklangs.

Starting with the key for our foundation, the process of developing a complete keygroup has been pointed out plainly: we set out with a Tonic; then discover the scale-half; then associate two scale-halves in one Septonate; and then add the five upmediates and the five downmediates, thereby perfecting the keygroup.

Starting with the scale for our foundation, the incorporation of the ten primary intermediates creates difficulties and confusion; we

set out on a Tonic, move up to its octave or move down to its octave, and so on *ad infinitum*. The difficulties and confusion are entirely removed by my conception of the keygroup and my conception of *the major and minor modes and scales as incidents in a single key*.

The terms *augmented* and *diminished*, although they intimate a modification of tones, are used in these pages purely in the sense of *enlarging and contracting the distances from one tone to another*, and therefore indicate the *lengths* of steps only.

As the changing of tones by so-called sharpening and flatting as well as inversions are entirely discarded from this System, the intervals of this group are described simply according to their positions and the lengths of their steps, as follows: *aug. o. 2d, aug. o. 4th; small o. 3d, dim. o. 4th; dim. u. 4th, aug. u. 4th, etc.*

The simplification of this group by dividing it into upmediates and downmediates, and by subdividing these into *overs* and *unders*, is apparent. The terms *upmediates* and *downmediates* at once give the student a concrete knowledge of the natural direction in which a voice on these tones progresses; and as the Principle of Progression is the *only* agency through which a student develops a perfect appreciation and intelligence of *the pure style and pure movement* (German: *reiner Styl, reiner Satz*), the practicability and propriety of these terms speak for themselves.

By way of past and current methods it is practically impossible for a teacher to explain to the actual understanding of his pupil what *pure voice-leading*, *pure style*, and *pure music* are. Yet these are the great *desiderata* at which a pupil is supposed and required to aim. Thus they are, in a word, aims which cannot be explained to a student's reason.

By way of the Principle of Progression the young beginner in music can learn precisely what these aims are and he can at once distinguish between the pure and the impure style.

The fact that the musical intuitions are more potent than textbooks in teaching the student of Harmony what pure voice-leading means, is illustrated by the following: During a Harmony lesson one of my classmates was called upon to write out a certain modulation on the blackboard; when the work was completed the Professor forcibly reprimanded him for poor work, lack of musical sense, and wretched voice-leading, sending him to his seat with the exhortation to apply himself to his studies more assiduously. Another pupil was then requested to do the work over again, and

this was done to the Professor's satisfaction, whereupon he addressed the class thus: "*There* is a young man who applies himself and who has learned something:" he then turned to the pupil who had failed, advising him to go home and do likewise. The real facts of this case were these: *A*, the unsuccessful, was a hard worker, depended entirely on his text-book, but lacked acute musical intuitions: *B*, the successful, was less diligent, paid little or no attention to his text-book, but possessed unusually acute musical intuitions. Yet *B*, although he felt that his work was right, could by no means explain *why* it was right.

Voices on upmediates and downmediates progress one half-step on the key-track and are therefore always resolved into a principal. This resolution may be either immediate by progressing at once to the anticipated principal, or it may be delayed by the interpolation of other intermediates and principals.

Following are examples of immediate resolutions: **Ex. 124.**

Beethoven: Op. 13.

The upmediates and downmediates in these examples all appear as *bytones* except the downmediate $\text{d}\flat$ in a), which forms part of a chord.

Those upmediates and downmediates on which we pass from the pole of one Septonate to the pole of another contiguous Septonate I call *polar* upmediates and *polar* downmediates : in the key of C they are as follows : **Ex. 125.**

a) $O. 4. \dots u. 4$

b) $u. 4. \dots O. 4$

Cases in which the resolutions of these intermediates are delayed by the interpolation of other tones are marked N. B. in the following examples: **Ex. 126.**

Von Weber: Rondeau.



Von Weber: Sonata in C.

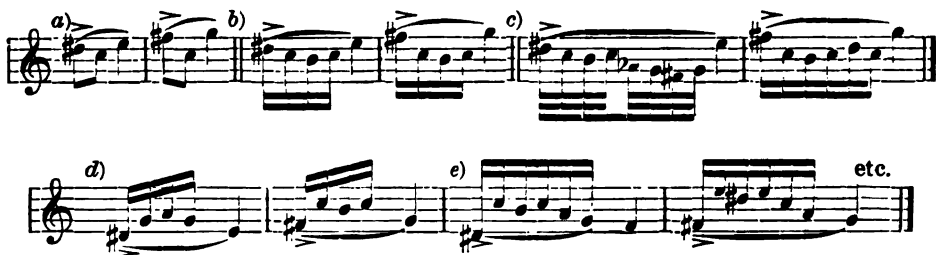


In these examples the resolution anticipated upon the first by-tone is not disturbed or weakened by its delay. This is the case whether bytones are principals or intermediates, the above progressions clearly being as follows: **Ex. 127.**



The resolution of an intermediate may be delayed indefinitely without dissipating the anticipation of progression. **Ex. 128.**

Upmediates.



Downmediates.



In these examples the upmediates and downmediates, like principals, appear as simple, regular passing, irregular passing, and

changing bytones. In one instance in **Ex. 124 a)** the downmediate $d\flat$ appeared as a component part of a chord. Other instances in which these ten intermediates occur as harmonics may be illustrated by an extract from the Sonata Op. 14 No. 2 by *Beethoven*, as follows: **Ex. 120.**



In the first measure $f\sharp$ is a downmediate and an harmonic. In the third measure $d\sharp$ is an intermediate and an harmonic.

This d# is a case of incorrect notation: the intention of the writer plainly indicates that this tone was conceived as a *down-mediate* and *not* as an *up-mediate*. This d# is one of the five up-mediates in the key of G, and its natural direction of progression is *up*. See N. B. in the following example: **Ex. 130.**



Instead of $d\sharp$ the notation should be eb in **Ex. 129**, and the harmony of the phrase is as follows: **Ex. 131**.



It is no more than reasonable that notation should be as plain as possible. It stands to reason that when an upmediate is intended, its corresponding sign should be used ; and that when a downmediate is intended, the sign for the downmediate should be employed. This point in notation should be consistently adhered to regardless of the past and current conceptions of so-called *sharp-keys* and *flat-keys* : this must and will be done provided that the validity of the System and the principles that are advocated in these pages cannot be disproved.

In this way every note on a page of music will tell its own story and thus convey to the reader's intelligence the exact character of the tone which the composer intended: *then downmediates will always be notated as b, bb, or ♭; then upmediates will always be notated as #, x, and ♯.*

In *sharp-keys* all notes prefixed by the added signs * ♯ and ♭ will be read and conceived as *downmediate keyklangs*: and all notes prefixed by the added signs # and x will be read and conceived as *upmediate keyklangs*.

In *flat-keys* all notes that are prefixed by the added signs ♭ and bb will be read and conceived as *downmediate keyklangs*: and all notes prefixed by the added signs ♯ and # will be read and conceived as *upmediate keyklangs*.

Further important simplifications resulting from my division of the ten intermediate keyklangs into upmediates and downmediates in accordance with the Principle of Progression will appear when we treat Harmony.

We may now continue our summary of the number of steps or intervals in the *large keygroup*, as follows:

In **Ex. 123** we find that there are *fifteen* steps from a Tonic to upmediates and *fifteen* steps from a Tonic to downmediates: thus there are *thirty* steps from a Tonic to the primary intermediates.

There being *twenty-one* principals in the *large keygroup* and there being *thirty* steps from each of these principals to the primary intermediates, it follows that there are $21 \times 30 = 630$ such steps.

There being *thirty* primary intermediates and *twenty-one* principals in the *large keygroup*, it follows that there are $30 \times 21 = 630$ steps from these primary intermediates to principals.

There being *thirty* primary intermediates in the *large keygroup*, it follows that there are, including primes, thirty steps from each such intermediate to the other intermediates, and therefore there are $30 \times 30 = 900$ such steps.

A complete summary of all the steps, or intervals, in a *large key-group* is as follows: **Ex. 132.**

<i>Steps from principals to principals</i>	441
<i>Steps from principals to intermediates</i>	630
<i>Steps from intermediates to principals</i>	630
<i>Steps from intermediates to intermediates</i>	900
<i>Total number of steps in a large keygroup</i>	2,601

* By *added signs* I mean such signs as do not appear in a signature.

We will now turn our attention to the *third* and *last* group of intervals.

The Third Group of Intervals.

To this group belong the remaining ten klangs of a tone-stratum, which have already been called the *ten secondary intermediates*.

These ten klangs cannot be incorporated into a keygroup, because they are not resolvable into *principals* but are always resolved into *primary intermediates*.

The secondary intermediates are modulatory and positively change the key, while the primary intermediates are always resolved into principals and do not necessarily change the key.

One key being constituted exactly like another key, the relationships of klangs in one key are, as a matter of course, alike in all keys. Thus what is said of one key applies to all keys.

Secondary intermediates modulate, and when such a modulation has been effected they are at once converted into the *secondary keyklangs*, or *primary intermediates* of another key. However, during the *process* of modulation and before a modulation has been consummated, these secondary intermediates occur in relation with the initial key, and in this relation they appear as and must be classed as ENHARMONICS. This point will receive further explanation later.

Tones, or klangs, appear or occur in three relationships: these may be specified as follows:

1. *The FIRST RELATIONSHIP includes all incidents that occur between PRINCIPALS AND PRINCIPALS.*
2. *The SECOND RELATIONSHIP includes all incidents that occur between PRINCIPALS AND PRIMARY INTERMEDIATES.*
3. *The THIRD RELATIONSHIP includes all incidents that occur between PRINCIPALS AND SECONDARY INTERMEDIATES, and between PRIMARY INTERMEDIATES AND SECONDARY INTERMEDIATES.*

Thus the First Group of Intervals presents tones in the First Relationship.

The Second Group of Intervals presents tones in the Second Relationship.

The Third Group of Intervals presents tones in the Third Relationship.

In Modulation, tones of the First Relationship are converted into tones of the Second Relationship and *vice versa*: again, in

Modulation, tones of the Third Relationship are converted into tones of the Second Relationship.

The subtle subject of Modulation will be considered at length in the last chapter.

This classification of tones into three relationships has an obvious practical value, inasmuch as it enables a student to learn to describe in which of the three relationships tones occur. A student learns to do this without difficulty: in his mind the First Relationship is associated with principals; the Second, with primary intermediates; and the Third, with secondary intermediates.

In order to complete the list of Tonic-intervals, those of the Third Group may be presented here.

The division of these intervals into *upmediate* and *downmediate* *enharmonics* and their subdivision into *overs* and *unders* do not call for further explanation. The abbreviations *d. dim.* and *d. aug.* indicate *double diminished* and *double augmented*, respectively.

Ex. 133.

1. Upmediate Enharmonics.

<i>d. aug.</i>	<i>aug.</i>	<i>d. aug.</i>	<i>d. aug.</i>	<i>aug.</i>	<i>d. aug.</i>	<i>aug.</i>	<i>d. aug.</i>
Prime	3d	4th	5th	7th	octave	10th	11th

2d	4th	5th	6th	octave	9th	11th
<i>d. dim.</i>	<i>d. dim.</i>	<i>d. dim.</i>	<i>dim.</i>	<i>d. dim.</i>	<i>dim.</i>	<i>d. dim.</i>

2. Downmediate Enharmonics.

<i>dim.</i>	<i>dim.</i>	<i>dim.</i>	<i>dim.</i>	<i>dim.</i>	<i>dim.</i>	<i>dim.</i>
3d	4th	6th	7th	octave	10th	11th

Prime	2d	3d	5th	6th	octave	9th	10th
<i>aug.</i>	<i>aug.</i>	<i>aug.</i>	<i>aug.</i>	<i>aug.</i>	<i>aug.</i>	<i>aug.</i>	<i>aug.</i>

Musical works taken as a whole present a chronological record of psychical evolution from simple to complex musical ideas, effects, and habits, and there is no telling to what degree of complexity the ideas, effects, and habits of the musical mind of future

centuries may develop. In other words, there is no telling whether at some remote period the melodies and harmonies of the Third Relationship may or may not be considered as agreeable and musical as we now consider those of the First and Second Relationships. In point of harmonic conception, the leaps from Scarlatti, Lully, and Bach to Mozart, from Mozart to Beethoven, from Beethoven to Wagner, are enormous and plainly indicate a steady and, in the later epochs, an almost precipitate advance from the simple to the complex. Hence there is every reason to believe that the path on which future music is to develop will lead to ever greater complexity of expression. Human faculty is destined to go on developing, and mental evolution in music is not likely to remain at a standstill. On first observation, modern music as compared to ancient music appears to have left old tracks for new ones. However, there is *one* track from which music has never deflected, namely, *the keytrack*. In whatever points the works of Wagner and Brahms differ from those of Bach and Mozart, the former do not deflect from the keytrack any more than the latter. To state the case more explicitly, the Preludes of Wagner's "Meister-singer" and "Tristan and Isolde" are no more *off* the keytrack than are Bach's simplest *Inventions* or Mozart's *Adagios* and little *Rondos*. From a purely musical point of view, the differences in the masterworks of successive epochs are in point of harmonic, rhythmic, and melodic conception, and all these works stand simply in the relation of simple to more elaborate. Had I the space here to add some of my comparative analyses of the music of various epochs, the above statements could easily be established as facts. As the music of all time has developed the keytrack, as all musical ideas have always been expressed in keyklangs, and as the ideas recorded in the masterworks are one and all analyzable into key-incidents, there is every ground to believe that music will ever continue on the keytrack. Composers like Liszt, Berlioz, and many others of less prominence, have, in their search for extreme effects and questionable musical originality, too often strayed from the beaten keytrack: such of their works as are fullest of these transgressions already show signs of decay and, like the works of many writers of earlier epochs, they are doomed to oblivion.

In the concluding chapter I will briefly consider the importance of the *keytrack* as set forth and elaborated in these pages to the establishment of a standard of composition, or as a means of plainly pointing out the exact nature of the *pure style* and there-

fore the difference between purity and impurity of style. The pure style has hitherto always been indefinable, and the music student has depended on his intuitions and musical feeling for any notion of it, while in cases where the natural intuitions and musical feelings of a student have been below the average the pure style has ever remained an enigma. As my System explains all this directly to the intelligence of a student by means of principles and definitions that are within any student's mental grasp, its value in this connection is too obvious to require further elaboration here.

The steps of the Third Relationship constitute the Third Group of Intervals and may be summarized as follows : **Ex. 134.**

<i>Steps from 21 principals to 30 secondary intermediates.....</i>	630
<i>Steps from 30 secondary intermediates to 21 principals.....</i>	630
<i>Steps from 30 primary intermediates to 30 secondary intermediates.</i>	900
<i>Steps from 30 secondary intermediates to 30 primary intermediates.</i>	900
<i>Steps from secondary intermediates to secondary intermediates.....</i>	900
<i>Total number of steps of the Third Relationship.....</i>	<u>3,960</u>

Complete Summary of the Intervals in Music.

In **Ex. 132** it was seen that a *large keygroup* contains all the steps of the First and Second Relationships, the total number of which was given as 2,601 : of this number 441 steps belong to the First Relationship, while the remaining 2,160 steps belong to the Second Relationship.

In the following example all the steps of the three Relationships are summarized : **Ex. 135.**

<i>First Relationship.....</i>	441 steps.
<i>Second Relationship.....</i>	2,160 steps.
<i>Third Relationship.....</i>	3,960 steps.
<i>Total number.....</i>	<u>6,561 steps.</u>

The above total presents the complete number of steps that are possible in three contiguous tone-strata. All steps that occur between one stratum and other strata that are still higher and lower are melodically and harmonically the same as corresponding steps between one stratum and a contiguous stratum : thus an interval is known as an *octave* whether it lies one, two, three, or four octaves over or under a center. This point was considered at an earlier stage of this chapter. (See **Ex. 112.**)

Thus the complete number of intervals in music is 6,561 : of

this number 2,601 are steps from keyklang to keyklang, and are therefore key-incidents: the remaining 3,960 are enharmonics and modulatory.

The 441 steps of the First Relationship are *all* in common use.

Most of the 2,160 steps of the Second Relationship are in use.

Most of the 3,960 steps of the Third Relationship are *not* in use.

The above problem may be computed in another way briefly as follows:

A klang has 21 relations in the First Relationship, 30 relations in the Second Relationship, and 30 relations in the Third Relationship, in intervals. Thus a klang has $21 + 30 + 30 = 81$ relations in intervals.

There being 81 tones in the three strata of this System, there are $81 \times 81 = 6,561$ intervals in the System. Over one-half of these intervals are not in use.

It is almost needless to say that the number of steps in each of the twenty-seven possible keys is equal: one key being made up of the same Relationships as another, all keys are alike when regarded separately: however when we regard keys collectively and attend to their differences in pitch, our summary of intervals is not complete until we estimate the *summa summarum* of all intervals in all keys. As 27 represents the number of keys, and as 6,561 represents the number of possible steps in one key, there are $27 \times 6,561 = 177,147$ possible intervals in music.

This somewhat startling sum of intervals need not alarm or discourage the music student, as the total 177,147 represents differences in *pitch* only, not in *relation*, and is therefore of no practical musical significance. Briefly then, there are but three Relationships, and these three Relationships aggregate 6,561 melodies of steps.

Although on first observation the above summaries may appear to contradict my claim that my conception of the Tonal System simplifies the study of music, such an objection would be equivalent to holding the analyst responsible for the fact that there are 6,561 steps in music, and this would be absurd. Indeed the fact that there are so many relations rather strengthens this claim than otherwise, for the position which I have taken in these pages calls for *exact hearing*, *exact observation*, and therefore for the cultivation of the ear to an intelligent discrimination of tonal relations: moreover, it points out a simple way by which these ends may be realized. The realization of these ends is not only immensely

simplified by my System, but they are unattainable through the medium of any other system.

Space does not permit me to do more than mention that the three Relationships as explained in this chapter offer a new and interesting means of tracing mental evolution in music from the most primitive to the most recent habits of musical thought.

The analyses thus far presented suffice to show the importance of mind in music: the two opposite points of view on this subject are strikingly illustrated by the following:

An eminent musician of Berlin (Germany) once remarked to me that he would not allow his sons to study music. When asked why? he replied, "It is too difficult." He thereupon explained that the study of music was so subtle and complex and that the chances of becoming a fine musician were so uncertain that he could not conscientiously encourage his children to take up music as a profession unless their talents were extraordinary. This is offset by the following remark of a layman which I overheard; it was this: "Don't let your son study music; rather let his *brains* be his capital!"

CHAPTER V.

HARMONY.

Analysis and Classification of Chords, or Combinations of Keyklangs.

THOSE of my readers who have carefully followed and thought out the analyses thus far presented will have become thoroughly familiar with the importance and meaning which I attach :

1. To *the key*, to *the keyklangs*, and to *the keytrack*.
2. To my conception of the Tonic as a *central* tone, and to my conception of a tone as an *harmonic center*, points which the analysis of the present chapter will still further elucidate, besides furnishing other new facts.
3. To my conception of *Centralization*, which makes *central C* the *starting point* of this System, *the main center from which the entire Tonal structure radiates and the commanding point from which we gain a most comprehensive view of this structure*.
4. To my conception of the *three Relationships of tones*.

I emphasize this realization of a *starting point* (*Ausgangspunkt*) for the reason that I believe the main causes of the general chaos that reigns in past and current systems of Harmony to be explained by the fact that hitherto no system ever had such a starting point or ever succeeded in demonstrating what such a starting point is. In the absence of such a haven from which to start and to which to return and reconnoitre when we are puzzled, it is not surprising that both theorist and student find themselves helplessly and aimlessly drifting in mid-sea without rudder or compass.

In order to obviate the possibility of any confusion in the minds of my German readers that might otherwise spring from their interpretation of some of the above terms, I will give a few German equivalents, which at this writing appear to be most fitting.

The German equivalent for *the key* is *der Tonschlüssel*.

The term *keyklang* may be interpreted *Schlüsselklang*, at least until some better equivalent is suggested.

The German word *Tonart*, which is commonly employed in the sense of *key*, but which cannot be so employed in this System without creating a good deal of unnecessary confusion, is used here in the sense of *mode*. The translation of a single sentence will elucidate this as follows :

The key has two modes: a bright, major mode; and a dark, minor mode.

Der Tonschlüssel hat zwei Tonarten: eine helle, dur Tonart; und eine dunkle, moll Tonart.

Other German equivalents are as follows: for *the scale-half*, *die Scalenhalbe*; for *the Septonate*, *das Septonat*; for *the three Relationships*, *die drei Verwandtschaften*.

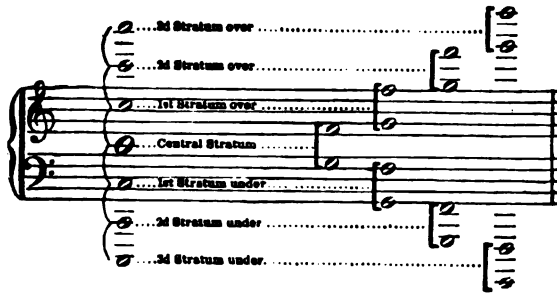
Any slight misinterpretation of terms creates confusion. New ideas have compelled me to imbue some old musical terms with new meanings and to add a small number of new terms in order to present my analyses in an intelligible manner. The problems in harmony before us call for greater breadth of conception and greater nicety of discrimination than those that have thus far been investigated.

The ideas, principles, and analyses in the preceding chapters have so clearly and repeatedly emphasized the position which I take that it has not impressed me as being necessary to urge my readers to *think out* all examples which have accompanied the text instead of going to a piano or an organ to play them. If these examples have been thought out I have reason to believe that my endeavors to state and explain matters plainly, both practically and theoretically, have been fairly satisfactory; on the other hand, if these examples have been merely reproduced on an instrument, I have every reason to believe that their purport and the essence of this investigation, namely, psychical analysis, have been completely missed. However, trusting that my readers have followed the former course in preference to the latter, I feel confident that all that has been said so far will be made still plainer by what follows.

Until now our view of this System from the main key-center, or main Tonic C, has been limited to an analysis and a description of the several units which have been named the scale-half, the Septonate, the keygroup, and the tone-stratum, and which collectively make up its complete structure. These units or parts of the

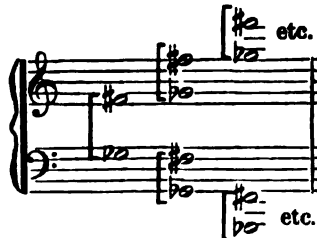
System, their differences, and their relations to a perfect whole have been sufficiently elaborated to prove that there are such units and parts in existence. This point disarms any critical objection that might be taken to the introduction of new terms by which to designate such parts. Not having been able to find adequate terms in current musical nomenclature by which to designate these parts of the System, new terms had to be coined: in doing this I have endeavored to select such words as appeared to me to be simplest, fittest, and most direct, in conveying the ideas they represent.

The following example affords a comprehensive view of Septonal strata and the centers by which they are united into a whole; the main Tonic-center is printed in larger type so that the eye at once selects it for the point from which the entire structure is to be viewed; each Tonic-center is placed directly opposite to the stratum to which it belongs, as shown by the dotted lines: **Ex. 136.**

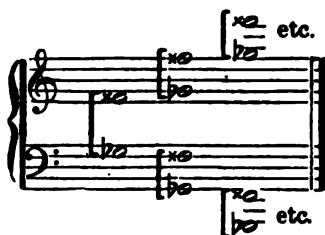


Knowing the exact constitution of a Septonate, the reader can easily fill in the remaining tones in each Septonal stratum and thus form a perfect concept of Septonal stratification.

To this let the reader add the ten primary intermediates, and he obtains a perfect concept of the *keygroups* of all strata; these strata reach from $g\flat$ below to $f\sharp$ above, as follows: **Ex. 137.**



Then by adding the ten secondary intermediates, a perfect concept is obtained of all *full* strata; the full stratum reaches from $g\flat$ below to $f\sharp$ above: **Ex. 138.**



The use of the word *tone-stratum* has proved very valuable in practice. In listening to music we hear voices moving in different strata: some moving about in one stratum, others crossing over in diatonic steps or in leaps from one stratum to another, all stopping on the center, o. 3d, or u. 4th of the stratum in which each happens to be at the termination of a period of music. We hear the *key-klangs* of one stratum or more accompanying those of others in two, three, four, five, six, and more voices; we hear dialogues between scale-halves; we hear voices imitating one another in higher and lower strata, sometimes single and sometimes combined; we hear other voices rapidly coursing through a series of strata in scale or *arpeggio* passages: in a word, we hear voices co-progressing in like, parallel, oblique, and opposite motion, and the stratum with its center, scale-halves, Septonate, and keygroup is our secure guide. Thus the student who has a concrete knowledge of the structure of the tone-stratum can start at a center and command the System from one extremity to the other, as illustrated in the above examples.

This perfect command of the System from one end to the other is what a student needs if he is ever to be master of the subject of Harmony. We shall see presently that this acquisition is immensely simplified by my conception of a tone as an harmonic center, as from such a center the student at once learns its entire harmony through all strata both above and below, and knowing its relations to other harmonies in one stratum he is able to conceive them in all.

In beginning our investigation of Harmony, I call attention to a nice distinction which must be made between *harmony in its purely PHYSICAL sense* and *harmony in its purely MUSICAL sense*.

Every tone has a pure physical harmony. This physical harmony is the only pure and therefore perfect harmony that exists.

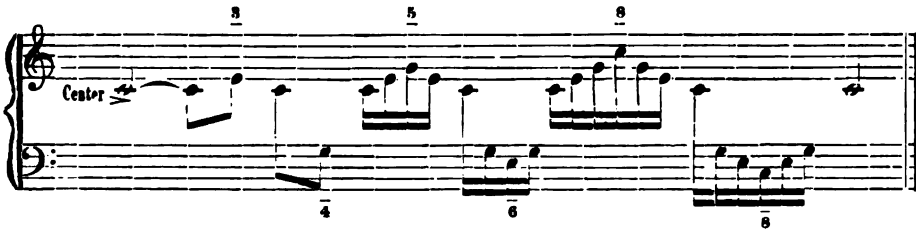
In music this perfect physical harmony is the harmony of the key-center or Tonic: and this fact explains the wonderful sense of repose which the Tonic produces in mind and body, the like of which is produced by no other harmony and by no other stimulus outside of music. In other words, there is nothing else in nature or in art,

there is no other combination of elements that has the power, even approximately, to put body and mind into such a state of perfect repose as has the Tonic-harmony at the termination of a tranquil piece of music.

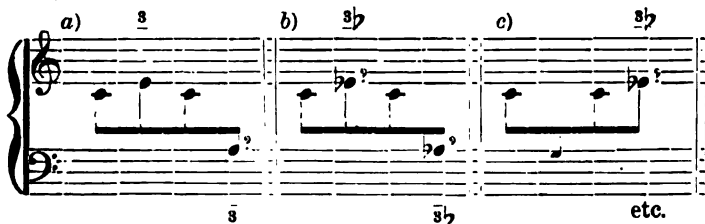
The perfect physical harmony and the Tonic-harmony being identically the same, let us inquire what this perfect harmony is; whether it ever occurs in music as the harmony of any other key-klang, or whether it is exclusively the harmony of the key-center, or Tonic. These inquiries will enable us to make the distinction between physical harmony and the harmony of music, to which I alluded a moment ago.

Think any detached, or isolated tone, and the keeping of such a single tone before the mind will be equivalent to a *dynamical accent*, whether we think it as loud, medium, or soft. Manifold experiments on average musical children and adults of all ages, trained or untrained in music, have without exception proved that such a detached tone generates *the same harmony in all minds*.

Let the reader take the first tone that occurs to him as an harmonic center, and it at once becomes an harmonic generator: as such a tone is detached and is therefore not connected in thought to any other tones, it generates its natural physical harmony in the mind. Let us suppose this tone to be middle C; we select its harmonics in rising and falling, as follows: **Ex. 139.**

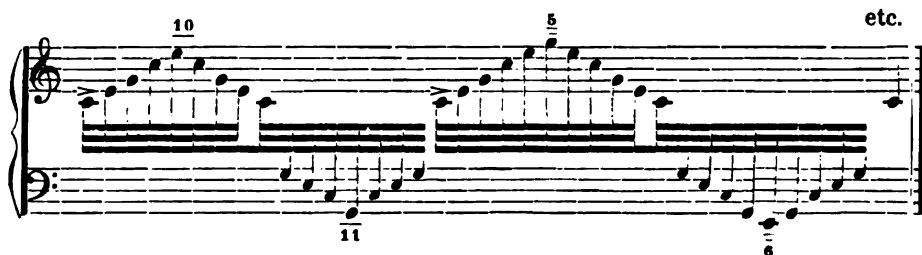


Our first selection in rising is the harmonic 3d; in falling, the harmonic 4th, and so on, as illustrated in the above example. In other words, the selection of any other save the tones indicated above would cost an effort and would seem most unnatural, as will be observed in **Ex. 140.**



Hereafter *over* intervals and keyklangs will be indicated by numbers *over* a short horizontal line: *under* intervals and keyklangs will be indicated by numbers *under* such a line, as shown in the above two examples. This has proved the simplest and most practical method of indicating positions of tones over and under a center, and as the line indicates the center, it has proved an equally efficient means of indicating chords, as we shall see presently.

Were we to continue the generation of the harmony from the center in **Ex. 139**, the result would be as follows: **Ex. 141.**



Whatever the center with which we start may be, our selection of harmonics is always the same, and every average musical child will choose the tones in the order of harmonic steps shown above, all of which illustrates the perfect adaptation of the mind to the physical nature of sound. The educational value of this latter fact will impress itself on every music educator, inasmuch as it plainly demonstrates that such a child is wonderfully well equipped to undertake the study of music on the basis of actual discrimination everywhere urged in these pages.

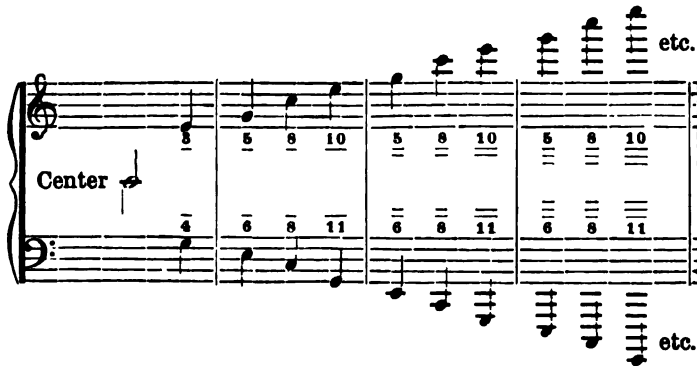
Upon thinking the perfect physical and what may as well be called the perfect psychical harmony of C, do the same with D \flat , B, E \flat , or any other tone, observing however that the mind is under the sole influence of one center at a time, and the results will be these: **Ex. 142.**



Thus it becomes clear that whatever the pitch of an isolated tone may be, our choice of its natural over and under harmonics is always the same. Every musician is free to experiment on average musical persons, young and old, trained or untrained in music, and in every case these experiments will prove that the physical

harmony is innate and forms part and parcel of the mental constitution of every average musical child. The fact that every beginner in music is thus armed by nature with something alike comprehensive and tangible by which he may easily acquire a clear oversight and a perfect command of the whole System from its center to both of its extremities will become still more obvious when we treat the Tonic-harmony and associate its harmonics with bytones.

The order of harmonics together with their keyklang-numbers, as shown in the above analyses of the perfect harmony, are as follows: **Ex. 143.**



The *key* and the *keyklang* place the problems of harmony in its purely musical sense in an entirely new light. Thus far we have considered the natural harmony of an isolated, or detached tone, that is to say, of a tone that is not relationed with other tones.

Harmony in music is concerned with the harmonies of *keyklangs*, and as no tone is conceived as a keyklang until it is relationed with other tones it becomes obvious *that the harmony of music is that harmony which is generated through the relations in which keyklangs occur.*

Thus harmony in music is the harmony of keyklangs: as all tonal incidents are key-incidents and as the key, considered as a unit, unites all tones into a perfect whole and presents them in their three Relationships, it follows that the harmony with which we have to deal is the harmony in which keyklangs combine *within one key*, and the harmony in which keyklangs combine in modulations from one key to another. Thus whether keyklangs modulate or not, some one key always reigns until it is superseded by another, and therefore the harmony of music is briefly and properly named *keyklang-harmony*, or simply *keyharmony*.

The distinction between harmony in its purely physical sense and harmony in its purely musical sense having been made plain, we may now proceed to demonstrate that the perfect physical harmony, in which all the elements, or harmonics, are in purest consonance and in perfect balance, is identical with the harmony of the key-center, or Tonic: that it is the only perfect harmony in music, and hence the sense of absolute repose which the Tonic produces in mind and body even though it is unaccompanied by other voices.

Before investigating the keyharmony, which here concerns us, a few preliminary statements and remarks are in order.

A keyklang has but one perfect harmony and this harmony arises when it is relationed as a Tonic.

The harmony of a keyklang varies as the relation in which it occurs varies.

Keyklangs may be combined in two, three, four, five, six, and more voices, and such combinations are known as chords: I name these chords respectively *two-klangs*, *three-klangs*, *four-klangs*, and so on, according to the number of klangs in each.

The number of such combinations, though very large, is limited by this System. The music student, though thus enabled to execute a full list of chords, would derive little practical benefit from such a computation, inasmuch as it would leave him completely ignorant of the true essence and significance of harmony. Such a list therefore has no practical value beyond showing the multiple varieties of combinations which are possible and which constitute the material of Harmony. This taking up of a little of the material of Harmony at a time and mechanically treating it according to the current plan is exactly what I object to, for it completely cuts off every stimulus to tone-thinking, upon which the development of the student's musical faculties depends.

The essence of harmony lies in Progression, that is to say, in the co-progression of two or more voices, and no student can learn to comprehend it by merely learning to connect strings of chords.

As in all language so also in the language of music we study for the purpose of learning to express ourselves, and thus by degrees we learn to understand the expressions of others. Thus the language of music should be studied for the purpose of understanding the literature of music. As standard musical literature is the record of the best thoughts of the best writers, it stands to

reason that the student should be educated to that concrete intelligence which will by degrees qualify him for a perfect comprehension of such thoughts. *These thoughts being PURELY MUSICAL have a PURELY MUSICAL content, and the intelligence requisite to an appreciation of such a PURELY MUSICAL content can be gained in one way only, namely, by PURELY MUSICAL analysis.* Briefly then: how are we to learn to understand the thoughts and ideas of the masters? *Simply by learning to think in the same language in which these thoughts and ideas have been conceived.* How all this appears in the light of current methods of teaching Harmony will become plain as we proceed.

What is a musical thought or idea? *Certainly not a fundamental or given bass*, as an examination of all text-books on Harmony and Thorough Bass would lead one to suppose.

A musical thought takes psychic form in *one voice*, and its harmony has its genesis in this voice. This voice represents the *central thought*: it consists of a series of keyklangs: its accompanying voices, which lie over or under it, or both over and under it, and which constitute its harmony, are its harmonic elaboration.

The central thought may be harmonized in many ways: the harmonization suggested by rhythm-harmonic Progression results in the *pure* style and in *pure* voice-leading: as this System is based on the Principle of Progression, we are concerned here with the pure style, or *natural* harmony, which has already been distinguished from *artificial* harmony.

All elaborations of the central thought, both harmonic and rhythmic, entirely depend on the nature of the central thought itself: the direction of progression, the diatonic, chromatic, and harmonic steps, the pitch, klang-color, dynamics, and rhythm of the central thought place the entire character and treatment of the accompanying voices in a subservient relation. Thus, in a word, *the central thought regulates and determines the character of its elaboration*: variations of whatever nature and degree in the central thought generate variations of a corresponding nature and degree in the concomitant voices.

For the reason that the voice that represents the central thought is prominent to the ear and mind over all its concomitant voices, I have already alluded to it as the *Prominent, or governing, Voice*.

It becomes obvious that to study harmony apart from a central thought, or governing voice, is to venture upon the impossible and

absurd. This is exactly what is required by current systems of Harmony and Thorough Bass. In all of these systems the student harmonizes fundamental or given basses, *not one* of which basses could ever be mistaken for a *central thought*. The *cantus firmus* in Counterpoint might be taken for a central thought and is so conceived; but unfortunately Counterpoint, instead of preceding the study of Harmony, succeeds it; and in Harmony everything is based on the given bass, and the student mechanically executes the chords which the given bass calls for.

Although the central thought may be in the bass, it never appears in the given basses alluded to above. The following excerpts are central ideas in the bass, but they are far from being anything akin to the erratic fundamental or given basses in question; and yet whenever they appear and reappear, they regulate and determine the current and character of all concomitant voices, and variations in them determine the variations in the concomitant voices. **Ex. 144.**

a) *Beethoven Op. 111.* b) *Symphony No. 3.*



etc.

c) *Symphony No. 2.*



It is a plain case that every bit of a student's work should consist in the elaboration of a central thought and should therefore start with a central thought as described above. Harmony in the concrete consists in the harmonization of such a central thought: Harmony in the abstract consists in regarding the varied combinations of tones as just so much material to be treated mechanically and apart from anything like an idea, according to the present Thorough Bass system: the former teaches the grammar of music through direct experience with and application to practical music itself; the latter attempts to teach grammar apart from such direct experience and application.

The BASS is NEVER the governing voice in harmony except when the CENTRAL THOUGHT occurs in the bass. This is shown in the above extracts from Beethoven.

My position in this connection is therefore very plain, namely,

THE CENTRAL THOUGHT IS ALWAYS THE GOVERNING VOICE, WHETHER THIS VOICE IS AN OUTER OR A MIDDLE VOICE. I therefore consider all systems of Harmony and Thorough Bass to be radically wrong at their foundation.

The klang-character of a chord depends upon which of its component voices is the Prominent, or governing, Voice. As was said before, the governing voice always sounds more prominent than its concomitant voices. Thus the klang-character of one and the same chord is completely changed as soon as we change the Prominent Voice from one of its component parts to another. In the example below the Prominent Voice appears in larger type: although the same chord is presented three times, this chord has three entirely different sounds, and this difference in sound is wrought by that part of the chord which is made prominent over all other parts.

Ex. 145.



This dynamical supremacy of the central thought is everywhere illustrated in musical writings, and this principle does not alone apply to melody in the conventional sense, but it applies as well to the most involved polyphony. The importance of this Prominent Voice to a pure and intelligent reading and expression of music has been considered by me elsewhere and is suggested here with sufficient plainness for our present purpose.

The facts that the study of Harmony consists in exercising the mind in the harmonic elaboration of central thoughts, that such a thought must be embodied in every exercise that a student writes, and that its elaboration and *purely musical* analysis constitute the practice which alone can develop an intelligent appreciation of harmony, now become self-evident.

The Tonic-Harmony, or the Harmony of the Key-Center.

We have observed that the Tonic-harmony is identical with the perfect physical harmony of a detached, or an isolated tone.

Thus any tone that we conceive as a Tonic generates the only perfect harmony that exists in music.

Our percept of a Tonic as a point of absolute repose has been

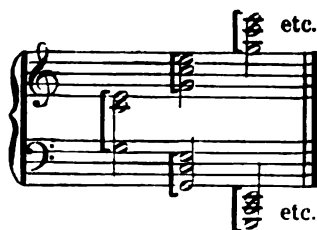
explained in preceding analyses by way of the Principles of Progression and Anticipation as consisting in the arrest of Progression and Anticipation, or simply in the desire to stop. This repose is caused by the harmony which such a Tonic generates in the mind and in which all the component elements are in perfect balance and consonance.

The scale-halves as they were analyzed in Chapter III. naturally become a *cantus firmus*, or Prominent Voice, and therefore a central thought consisting of a series of keyklangs. Thus the harmony that is generated by such a series of keyklangs must be the natural harmony by which the keyklangs are united into a key, and as on a scale-half we are all compelled to think the same keyklangs in the same relations, the same harmony is generated in our minds. That the terminals of all separate scale-halves are Tonics both in rising and in falling is proved by the genesis in the mind of the Tonic-harmony on each such terminal, as follows: **Ex. 146.**



How these scale-halves are united into a single key was fully explained in Chapter III.

As was shown above, the *full harmony* of a keyklang comprises all its harmonics from a center to both extremities of the System. Thus the *full Tonic-harmony* represents all Tonic-centers and their harmonics in all strata, and each stratum presents the same combination of three keyklangs as follows: **Ex. 147.**



All the above combinations are *sections* of the *full harmony* of central C. These sections are all alike, and each consists of three keyklangs, namely, a Tonic-center, a large over 3d, and a pure

under 4th, and such a combination is therefore called a *three-klang*.

Thus the above chords represent the major threeklang of C in five strata.

The distinction between a *full harmony* and a combination of keyklangs being made plain, we may now consider what the root of a chord is and how the positions of chords are to be described.

All *full harmonies* are generated from roots which lie in the central stratum ; these roots have already been named and explained as harmonic centers and generators.

Chords may be formed in all strata ; the position of every chord is described according to the position of its root.

The root of a threeklang may lie in any stratum, high or low, and it may appear as a groundtone or bass, as a middle voice, or as an upper voice. Thus the threeklangs in **Ex. 147** all appear in the same position, and as in each the root, which is Tonic C, lies *between* the two other klangs, this position of a threeklang must be described as *central*.

Following are the *three* positions in which the Tonic-threeklang appears: **Ex. 148**.



The position of the first of these chords is marked *under*, because the root C is on top : the next chord is marked *central*, because the root C lies between the other two tones and because this is the first threeklang that is generated from a Tonic-center : the last chord is marked *over*, because the root C is at the bottom.

Each of the above chords is an *individual* chord, and *neither of the three is an inversion or another position of the other two*. But each is a Tonic-threeklang and the three have the *same* individual Tonic for their common root. Thus the above three chords present the three forms of the Tonic-threeklang in relation to *one center*, in *close voicing*.*

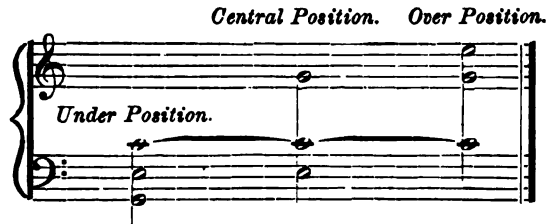
Again, each of the above chords has a different groundtone, and the last of the three is the only one in which the *root* appears as a groundtone.

* I use the terms *close voicing* and *open voicing* in preference to *close position* and *open position*, because the word *position* has been so generally employed in another sense in these pages and because the word *voicing* is better calculated to direct the pupil's attention to the co-progression of voices.

As the terms *groundtone* and *root* are both suggestive of a fundamental or bottom tone, I shall hereafter use the term *chord-center* in place of the term *root*.

It is obvious that a groundtone is not necessarily a chord-center, or *vice versa*, and it is likewise obvious that the ground-voice, or bass, does not regulate harmonic elaboration unless it represents the central idea.

Following are the Tonic-threeklangs of one Tonic-center in *open voicing* : **Ex. 149.**



Every Tonic-center of every stratum is the chord-center of three Tonic-threeklangs. These threeklangs are presented below on the Tonic-centers of other strata : the letters *c.*, *o.*, and *u.* indicate central, over, and under, respectively : **Ex. 150.**



The above threeklangs and those on the Tonic-centers of all other strata represent just so many sections of the full Tonic-harmony, and, as the above examples plainly show, each Tonic-center is the chord-center of three such sections.

A full section of the perfect harmony contains three individual keyklangs, and each section is an independent chord and is therefore immutable and uninvertible.

The terms *central position*, *over position*, and *under position* are used here exclusively to describe the *exact situation of each threeklang in relation to its chord-center*.

Every keyklang is an harmonic center and is the chord-center of three threeklangs, as follows :

1. *A central threeklang.*
2. *An over threeklang.*
3. *An under threeklang.*

Thus the familiar rule, namely, that a threeklang, or triad, has three positions and may be inverted twice, is rendered untenable by the principle that tones are individual and immutable. The current view of the three positions of a triad is presented below together with my description of these triads, for comparison:
Ex. 151.



In *a)* the chord-center of the first triad lies in the *central stratum*, while the chord-center of the second and third triads lies in the *first stratum over*. The dotted lines show plainly where the three triads in *a)* belong and how they are to be described.

In current systems of Harmony and Thorough Bass, Roman numbers are employed to indicate the *fundamental bass*.

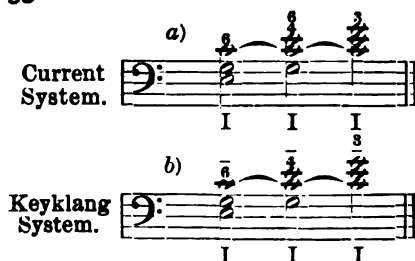
In this System, Roman numbers are employed to indicate the *chord-centers*. **Ex. 152.**

Thorough Bass System: I, II, III, IV, V, VI, VII°.

Keyklang System: u.IV, u.III, u.II°, I, o.II, o.III, o.IV.

Again, current systems employ Arabic numbers to indicate the inversions of chords, computing the intervals in a chord from the groundtone, or bass, up.

This System discards *inversions*, and the intervals in a chord are computed according to their distance over and under a chord-center. The result is similar to that of current systems, as will be seen below. **Ex. 153.**



Because the terms *central*, *over*, and *under* answer all purposes for describing *threeklangs*, the above Arabic numbers are superfluous. The following three rules suffice to describe all *threeklangs*:

Rule 1. *Whenever the OVER THIRD of a threeklang appears in the bass, the combination of keyklangs is an UNDER CHORD.*

Rule 2. *Whenever the UNDER FOURTH of a threeklang appears in the bass, the combination is a CENTRAL CHORD.*

Rule 3. *Whenever the CHORD-CENTER of a threeklang appears in the bass, the combination is an OVER CHORD.*

These three rules apply to all *threeklangs*, in whatever strata they may occur, and whether they appear in two, three, four, or more voices. The following examples illustrate this: **Ex. 154.**

The musical examples are arranged in three rows. Each row contains one or more measures of music in a specific key signature and time signature, with labels above and below the notes indicating the type of threeklang and the resulting chord.

- Row 1:**
 - Example 1) Bass clef, 2/4 time. Notes: G2, B2, D3, F3, A3, C4. Labels above: u, o, o, o, c, o. Labels below: I u.IV I u.III I u.IV I.
 - Example 2) Treble clef, 2/4 time. Notes: G4, B4, D5, F5, A5, C6. Labels above: o, c, o, u, u, o, c, u. Labels below: I o.IV I o.II I o.IV u.IV I.
- Row 2:**
 - Example 3) Treble and Bass clef, 2/4 time. Notes: G4, B4, D5, F5, A5, C6 (treble); G2, B2, D3, F3, A3, C4 (bass). Labels above: P.V. o, u, o, o, u, o, o, o. Labels below: I I o.IV o.II u.IV I u.IV I.
 - Example 4) Treble and Bass clef, 2/4 time. Notes: G4, B4, D5, F5, A5, C6 (treble); G2, B2, D3, F3, A3, C4 (bass). Labels above: o, u, o. Labels below: I u.IV I.
- Row 3:**
 - Example 5) Bass clef, 2/4 time. Notes: G2, B2, D3, F3, A3, C4. Labels above: u, o, o. Labels below: I u.IV I u.IV u.IV I.
 - Example 6) Treble clef, 2/4 time. Notes: G4, B4, D5, F5, A5, C6. Labels above: u, o, o, o. Labels below: I u.IV I u.IV.
 - Example 7) Treble and Bass clef, 2/4 time. Notes: G4, B4, D5, F5, A5, C6 (treble); G2, B2, D3, F3, A3, C4 (bass). Labels above: o, o, u, o, o, u. Labels below: I u.IV I u.IV u.IV I.

The upper voice in these examples is the *Prominent Voice*, as indicated in the first Ex. by *P. V.*

The description of *threeklangs* having been made plain, let us consider more carefully the several voices that are combined in a chord.

We do not perceive the perfect effect of a chord unless we hear its component *keyklangs*. As each component *keyklang* represents a voice, such discrimination of several voices is the only medium

through which we are enabled to perceive the effect of one voice on another, the antagonisms and agreements of voices, and their harmonic relation to the Prominent Voice, which they elaborate. In appreciating these antagonisms and agreements, or progressions and resolutions, we get at the true essence of harmony. This is the very point which is missed by the average student, and the Thorough Bass system is the cause of this failure, as will be still further explained presently.

The student of this System learns the keyklangs at the outset, and in his first exercises with one voice he soon learns the lengths of steps as well. Thus by the time he treats two voices, he has reached the automatic stage both in keyklangs and the lengths of steps, that is to say, he does not have to stop to think and compute. Therefore when treating two voices, the student is not hampered by rudimentary and mechanical difficulties in intervals; his mind is free to enter upon the new problems of harmony and he is bent on the progressions of voices and their harmonic relations. Thus equipped, the student learns to hear the keyklangs in each of the several voices, he learns to follow the progressions of each voice and knows the intervals of the several voices collectively. A series of chords is properly conceived as combinations of voices in co-progression: the discrimination of such a series requires a synthetic ear: such hearing can alone be developed on the keyklang basis, as every combination is a combination of keyklangs. When a student can give his whole attention to voice-leading and to harmonic and rhythmic elaboration, when he does not have to stop to compute intervals and wonder how it all sounds, he may then consider the first keyklang stage as surmounted, and may further consider himself prepared to embark on higher problems in Counterpoint and Harmony.

As space does not permit me to do more than suggest my methods of teaching, the following examples in two and three voices will suffice to show the importance of a perfect appreciation of the keyklangs in each voice. **Ex. 155.**

The musical notation shows two exercises, labeled 'a)' and 'b)', written on a single staff. Exercise 'a)' is titled 'P.V.' and consists of three measures. The first measure contains a half note G4 (labeled '8'), a quarter note A4 (labeled '2'), and a quarter note B4 (labeled '8'). The second measure contains a half note C5 (labeled '4'), a quarter note D5 (labeled '5'), and a quarter note E5 (labeled '4'). The third measure contains a half note F#5 (labeled '8') and a whole note G5 (labeled '1'). Exercise 'b)' continues from exercise 'a)' and consists of four measures. The first measure contains a half note G5 (labeled '10'), a quarter note A5 (labeled '8'), a quarter note B5 (labeled '9'), and a quarter note C6 (labeled '10'). The second measure contains a half note D6 (labeled '11') and a whole note E6 (labeled '1'). The third measure contains a half note F#6 (labeled '11'), a quarter note G6 (labeled '10'), a quarter note A6 (labeled '9'), and a quarter note B6 (labeled '10'). The fourth measure contains a half note C7 (labeled '9'), a quarter note D7 (labeled 'A#'), and a quarter note E7 (labeled '9').

In these examples the keyklang numbers are given : if a student has not overcome the keyklang stage, it would be a complex matter for him to treat exercises even as simple as those above, for he would have to analyze the keyklangs and the intervals of each separate voice besides having to observe the harmonic relations of the collective voices, all of which would hinder him from appreciating co-progression, rhythmic, harmonic, and dynamical inter-relations, and would therefore debar him from that concrete exercise which his faculties need. However, the student that studies keyklangs and intervals on the plans set forth in preceding chapters knows his keyklangs and intervals by heart, and in such exercises as the above his attention is exclusively bent on the co-leading of voices, their inter-relations and their analysis into harmonics and bytones.

Current systems confine students to vocal treatment, and this greatly interferes with the acquisition of freedom and independence of treatment and hinders a student from perceiving how to apply his knowledge practically to musical literature. The piano and organ are the most efficient companions for exact music study, owing to the fact that on them all music for all instruments can be reproduced : while all other instruments, in consequence of their limited range, represent but fractions of a whole, the piano and organ represent a whole. For this reason all those performers on fraction instruments who desire to widen their intellectual horizon in music have recourse to a piano and sometimes to an organ. As the student of Counterpoint and Harmony generally practices some instrument, this instrument usually being a piano, it stands to reason that his theoretical acquisitions should be such as to enlighten him in the forms and styles of writing that he hears and studies daily and in which he is most interested. Absolute vocal treatment does not furnish this *desideratum*, and therefore instrumental treatment should be practiced in conjunction with vocal treatment. There is an immense difference between vocal and instrumental treatment of counterpoint and harmony, and by practicing both, the student learns to appreciate these differences and will not wonder, as he commonly does, why Bach, Mozart, and Beethoven are so often violating what he learns to be precepts or rules : he will not have to wonder why the greatest composers had a right to write things which are rigorously forbidden him.

For these reasons and a hundred others it is most practicable

to give students an opportunity to practice both the vocal and instrumental styles, first separately and then by associating the two, about as follows :

1. Voice with vocal counterpoint.
2. Voice with instrumental counterpoint : as for example, harp, piano, organ, guitar, or mandolin.
3. Two voices : vocal treatment, or duet.
4. Two voices with instrumental counterpoint.
5. Three, four, and more voices : pure vocal treatment.
6. Three, four, and more voices : pure instrumental treatment. For example, short trios, quartettes, quintettes, and sextettes : for strings alone ; for piano and strings ; for wind instruments alone ; for wind instruments and strings ; for piano and wind-instruments ; for piano, wind-instruments, and strings ; and so on. Of course the terms *trio*, *quartette*, etc., are used here simply in the sense of three-voiced, four-voiced thinking and writing.
7. Further development of vocal and instrumental writing, separate and combined.

Such practice as this will give the student just what he most needs, namely, practical application to practical music of what he learns from day to day and from lesson to lesson.

When elaborating voices start and stop in the same stratum or when they appear in small figures, in imitations or otherwise, they are heard and thought in relation to the Tonic-center of the particular stratum in which they arise, no matter how high or low the stratum may be. Such a Tonic-center is always associated with its keyklang number (1), and the remaining tones of the figure are numbered in relation to 1 just as they would be in the central stratum. The following examples present such figures with keyklang numbers and will at least suggest the value of instrumental treatment in conjunction with vocal treatment as a means of developing freedom, independence, and oversight in the young student. **Ex. 156.**

Every tone in every stratum is the chord-center of a group of three threeklangs. Before investigating other chords a few points concerning the Tonic chord and keyklang harmony require further analysis.

In the major Tonic chord we hear the three components as follows :

1. The Tonic-center.
2. The under-Dominant.
3. The bright, major over 3d.

When a student hears the keyklangs in this chord and knows what they are, his concept of the combination is perfect. On the other hand, if he merely learns that a triad is built by adding a third and a fifth to a fundamental tone, as is the custom, he has no concept whatever of the klang of a combination.

The *Septonate*, the basis of the centralized System, contains but *one* major Tonic chord and but *one* Tonic chord-center : this chord is the central chord.

The *scale* (our overscale) contains *two* major Tonic chords and *two* Tonic chord-centers.

The *full scale-system* contains *five* major Tonic chords and *three* Tonic chord-centers. See below : **Ex. 157.**

Septonate. Scale.

Full Scale-system.

underscale. Septonate. overscale.

Detailed description: The musical notation is divided into three parts. The first part, labeled 'Septonate.', shows a bass clef staff with a key signature of one sharp (F#) and a common time signature. It contains a sequence of notes: C, D, E, F#, G, A, B, C, with a 'c.' above the first C. The second part, labeled 'Scale.', shows a treble clef staff with a key signature of one sharp (F#) and a common time signature. It contains a sequence of notes: C, D, E, F#, G, A, B, C, with a 'u.' above the final C. The third part, labeled 'Full Scale-system.', shows a bass clef staff with a key signature of one sharp (F#) and a common time signature. It contains a sequence of notes: C, D, E, F#, G, A, B, C, with a 'u.' above the first C, a 'c.' above the fourth F#, and a 'u.' above the final C. The staff is divided into three sections: 'underscale.' (C to F#), 'Septonate.' (F# to B), and 'overscale.' (B to C).

Were there such things as a 1st, 2d, and 3d position of a chord, the Septonal Tonic chord (a) in the above example) would have to be called the *first* position. Such a conception of positions is untenable, inasmuch as *no chord has more than one position*. I think that it has been made clear that there are *three* forms in which a threeklang may appear in close voicing ; each of these three forms is an independent chord, the chord-center being the only tone common to the three : the terms *central*, *over*, and *under positions* indicating the location of each of the three chords in relation to its

chord-center and by no means implying three positions of one and the same chord. The Septonal position of the Tonic chord must be regarded as the *original* Tonic chord, inasmuch as it is the first that is generated from a Tonic-center by adding its first over and first under harmonics.

Were we to seek the first and original position of a Tonic chord in the full scale-system (*c*) in the above example), and to regard the scale as the basal unit in music, we would indeed be perplexed in attempting to decide which of the five Tonic chords is the original one.

A tone being an harmonic center and having related tones both over and under it, it is both reasonable and logical that chords may be built over such a center, under such a center, and both over and under such a center.

Although a Tonic threeklang contains the three harmonics which appear in every stratum as the components of the *full harmony* of a chord-center, yet such a threeklang fails to impress the mind as being complete or in perfect balance and does not therefore represent a *full* chord. If, for illustration's sake, we liken what would be a *full* chord with a column, the incompleteness of the three Tonic threeklangs will present itself as follows: the *over* chord has a base and a shaft, but no capital; the *central* chord presents a shaft without either base or capital; the *under* chord presents a shaft and capital, but no base. These three chords are therefore not complete until we add a capital to the first, a base and capital to the second, and a base to the third. In musical parlance, we hear that the first chord wants an upper voice; the second, an upper and a lower voice; the third, a lower voice. Introspection will show that we distinctly perceive that these wanting top-tones and bottom-tones are the octaves of the chord-center, as follows: **Ex. 153.**



Central C is the chord-center of the above full chords: the first chord is built over the main center; the second chord is built both over and under the main center; the third is built under the main

center. The fact that chords are not full in three voices accounts for the common custom of beginning Harmony with four voices.

Later on I shall show that the Tonic chord often appears without the Tonic itself and therefore without its chord-center. This is true also of other chords and is due to the particular relation in which keyklangs occur. These points go far towards demonstrating the importance and necessity of careful psychological analysis in music, and such analyses will furnish physicists with undreamed-of problems. Manifestly the path pointed out by modern psychology is the only one that can ever lead to a solution of music problems.

A few pages back I pointed out the fact that any detached tone that we chose to think as a chord-center generated the same harmony in all minds. Thus together with the isolated chord-center C we hear *e* above and *g* below; with the chord-center D we hear *f*♯ above and *a* below; and so on. Now let us think C and *d* and *b* as *keyklangs* and let C be our Tonic, whereupon *d* and *b* will become an over 2d and an under 2d, respectively. Let our Prominent Voice, or *cantus firmus*, be C—*d*—C—*b*—C, and no *f*♯, no *d*♯, and no *a* will be generated in the mind, simply because the tones C—*d*—C—*b*—C are now conceived as *keyklangs*; they are thought in relation with one another, this relation generates its concomitant harmony, and this harmony is the harmony of *keyklangs*, which is the only harmony that concerns us in music. The harmony of this Prominent Voice is as follows: **Ex. 159.**



To be still more explicit, when we relation C—*d* as 1—2, the concomitant harmony on each of the two *keyklangs* is apperceived as follows: **Ex. 160.**



The above Prominent Voice is conceived as an upper voice; thus *a*) in this example shows the order in which we hear the harmonics; *b*) presents three concomitant harmonics as so many voices.

Relation $C-b$ as $1-\bar{2}$, and our apperception of the order of harmonics and their combination is this: **Ex. 161.**



The fundamental, or natural, harmony of the keyklangs is shown in the following counterpointed scale-halves: **Ex. 162.**



These examples point out exactly what I mean by keyklang-harmony. Why the above keyklangs *d*, *b*, *e*, and *a*, do not generate their respective physical harmonies must have a physical explanation which acousticians are invited to discover. The psychical effect of these keyklangs and the harmony which they generate in the above relations being the same in all musical minds overwhelmingly proves that the psychical effect of the harmony of keyklangs is at present the only common ground on which music-theorists and philosophers, practitioners, and students can hope to explain the phenomena of music.

The above examples are also given to suggest approximately

the sort of work which I require of my pupils: namely, the conception of a Prominent Voice and its ultimate elaboration, which conception and elaboration must always represent just so much pure mental exercise. In a word, pupils are compelled to depend on their own heads for their ideas and elaborations, taking as models for practice the best and purest examples from the masters.

A few pages back I referred to the full Tonic-harmony as an additional and reliable means of enabling the student to command the full scope of the System by associating bytones with the harmonics of the full Tonic-harmony: I say *additional*, because the command of the System was made possible by the scale-halves, the Septonate, the keygroup, and so on; *reliable*, because the full Tonic-harmony is the common possession of all musical minds. A few examples will impress the practical significance of mentally associating bytones with the harmonics of the Tonic chord-center.

Ex. 163.

1. Simple Bytones.

a) 1 2 1 2

b) etc.

c) etc.

d) etc.

e) etc.

2. *Passing Bytones.*

a)

b)

c) (*in skips*)

d)

3. *Changing Bytones.*

a)

b)

It is customary not to treat simple, passing, and changing bytones until Counterpoint is taken up. This is a serious obstacle to the student of Harmony, because his appreciation of pure harmony, of the so-called strict style and pure musical syntax cannot be developed until these antagonistic tones have received a good deal of attention and practice. It stands to reason that no one can comprehend what pure harmony is if he does not know what the elements are that under certain conditions cause the harmony to be impure. Besides, the bytones occur everywhere in music, the

student is hearing and playing them day after day, he intuitively feels that they are the most expressive tones in music, and therefore he should become instructed in them as early as possible.

Why is a bytone the most expressive tone in music? Because bytones stimulate the desire to progress; this sense of Progression is at once converted into Anticipation; the tone anticipated is the one into which we all desire to resolve the bytone; a slight delay of this resolution causes a sense of suspense and thus slightly prolongs the moment of Anticipation. As was explained at an earlier stage of this writing, we depend on a perfect Anticipation for our enjoyment and comprehension of all things: now as the bytone excites the same Anticipation in all musical natures, young and old, trained and untrained, it is only reasonable that a student should make an early acquaintance with these expressive bytones, if for no other purpose than to obtain that which will enable him to express music intelligibly and feelingly. I think the above facts point plainly to the necessity of placing Counterpoint before Harmony in the curriculum of music.

In the above examples both principals and intermediates appear as bytones. These intermediates are so many keyklangs, and their keyklang numbers and signs are presented below in different strata: **Ex. 164.**

1. *Upmediates.*



2. *Downmediates.*



The secondary intermediates are numbered similarly, as follows: **Ex. 165.**

	G×	B♯	C×	E♯	F×
<i>Central stratum</i>	<u>4</u> ×	<u>2</u> ♯	1×	<u>3</u> ♯	<u>4</u> ×
<i>1st Stratum over</i>	<u>5</u> ×	<u>7</u> ♯	<u>8</u> ×	<u>10</u> ♯	<u>11</u> ×
<i>2d Stratum over</i>	<u>5</u> ×	<u>7</u> ♯	<u>8</u> ×	<u>10</u> ♯	<u>11</u> ×
<i>1st Stratum under</i>	<u>11</u> ×	<u>9</u> ♯	<u>8</u> ×	<u>6</u> ♯	<u>5</u> ×
<i>2d Stratum under</i>	<u>11</u> ×	<u>9</u> ♯	<u>8</u> ×	<u>6</u> ♯	<u>5</u> ×
	A♭	B♭	C♭	E♭	F♭
<i>Central Stratum</i>	<u>3</u> ♭	<u>2</u> ♭	1♭	<u>3</u> ♭	<u>4</u> ♭
<i>1st Stratum over</i>	<u>6</u> ♭	<u>7</u> ♭	<u>8</u> ♭	<u>10</u> ♭	<u>11</u> ♭
<i>2d Stratum over</i>	<u>6</u> ♭	<u>7</u> ♭	<u>8</u> ♭	<u>10</u> ♭	<u>11</u> ♭
<i>1st Stratum under</i>	<u>10</u> ♭	<u>9</u> ♭	<u>8</u> ♭	<u>6</u> ♭	<u>5</u> ♭
<i>2d Stratum under</i>	<u>10</u> ♭	<u>9</u> ♭	<u>8</u> ♭	<u>6</u> ♭	<u>5</u> ♭

Ex. 164 explains how the student of this System describes the secondary keyklangs in **Ex. 163**, and therefore how all secondary keyklangs are described.

I cannot stop here to do more than mention that in teaching the earliest stages of Counterpoint in two voices, I require pupils to elaborate a simple Prominent Voice in the simplest manner; they are not taken beyond the First Relationship until they have mastered it; simple, passing, and changing bytones, as well as suspensions and modulations are not introduced into these exercises until the pupil has had sufficient practice with harmonics, but when they are introduced they are taken up in the order mentioned and practiced until each is comprehended in its turn.

Modulation and Suspension are both practiced by my pupil during the one-voice stage. The reader may object that suspensions require at least two voices for treatment. This is, however, not the case, as will be demonstrated in the concluding chapter, in which the subjects of Modulation and Suspension are considered.

As this investigation of Harmony must needs be limited to a brief presentation of the chief effects of *Centralization* and of the principles here advocated on the most important problems in Harmony, matters will be simplified by at once giving a sketch of my classification of chords.

Classification of Chords.

Like intervals, I divide chords into *three groups* and *three Relationships*.

The three groups of chords are named :

Group 1. CHORDS OF THE FIRST RELATIONSHIP.

Group 2. CHORDS OF THE SECOND RELATIONSHIP.

Group 3. CHORDS OF THE THIRD RELATIONSHIP.

The CHORDS of the FIRST RELATIONSHIP include all combinations of PRINCIPALS and PRINCIPALS: in twoklangs, threeklangs, fourklangs, fiveklangs, and sixklangs. This group is subdivided into CONSONANCES and DISSONANCES.

The CHORDS of the SECOND RELATIONSHIP include all combinations of PRINCIPALS and PRIMARY INTERMEDIATES, and of PRIMARY INTERMEDIATES and PRIMARY INTERMEDIATES: in twoklangs, threeklangs, fourklangs, fiveklangs, and sixklangs. This group is subdivided into CONSONANCES and DISSONANCES.

The CHORDS of the THIRD RELATIONSHIP include all combinations of PRINCIPALS and SECONDARY INTERMEDIATES; of PRINCIPALS, PRIMARY INTERMEDIATES, and SECONDARY INTERMEDIATES; of PRIMARY INTERMEDIATES and SECONDARY INTERMEDIATES; of SECONDARY INTERMEDIATES and SECONDARY INTERMEDIATES: in twoklangs, threeklangs, fourklangs, fiveklangs, and sixklangs. This group is subdivided into CONSONANCES and DISSONANCES.

This classification is the first of its kind that includes all possible combinations of klangs. This is true also of the classification of intervals in the preceding chapter.

Like intervals, chords are easily described by students as belonging to the First, Second, or Third Relationship.

In the following series of chords the three Relationships are introduced and are marked 1st, 2d, and 3d, respectively. **Ex. 166.**



Most of the chords of the Second Relationship and all the chords of the Third Relationship are commonly classed as *altered*, or *changed*, chords. In accordance with the Principle advocated

in these pages, namely, that tones cannot be changed by modification in pitch, it follows that *altered*, or *changed*, chords do not exist. Thus like klangs and intervals, chords *are* what they are; one chord cannot be transformed into another chord; the only change a chord can undergo is the change of its relation; every chord represents a different combination of different keyklangs, and the analysis of a chord consists:

1. In observing the keyklangs of which it is composed.
2. In observing the relation in which it occurs.

It is hardly necessary to state that less than one-half of the chords of the Second Relationship and but a small fraction of those of the Third Relationship are in use. Hence a full list of chords in accordance with the above classification would present more chords that are unfamiliar than chords that are familiar.

As I said before, musical mind is bound to develop to greater complexity in its ideas and expressions, and there can be no doubt but that future generations will employ many combinations which now would be regarded as unmusical. However, it is unlikely that the musician of the future will ever cease to delight in the pure style or cease to revere the works of Bach, Mozart, Beethoven, and we may add, Brahms. For in pure instrumental composition Brahms is at present the exponent of the highest intellectual development in music, one of the incontrovertible proofs of this fact being this, namely, that the compositions of this profound musical thinker are but slowly gaining proselytes even among musicians. The strong intellectual fibre of Brahms' mind and its lofty and noble discourse cannot be generally appreciated until long after the plane of music education has been elevated from intuition and mere feeling to intelligence and discrimination, to the feeling of ideas. For of the greater works of Brahms, as of the greater works of a Bach and of a Beethoven, we must be able to say: I feel and am moved by that which I understand. Merely to say: I feel it, I do not feel it; it moves me; it does not move me; and all similar expressions, do not necessarily mean that we individually represent anything more than what in my Introduction was called a bundle of sensations. "Seek and thou shalt find," but always remember that your search will be in vain unless you know *what* you are looking for. Careful analytical readings of the works of Brahms will reveal to the music psychologist a refinement of conception and a depth of intellectuality and sentiment of a kind that is calculated to raise the enjoyment and ex-

pression of music from sensuousness to intelligence, and while in his elaborations and polyphony this great poet enters previously unknown regions of musical thought, his central ideas are often so simple, pure, and stern as to tempt us to name him the Schiller of composers. Whatever objection may be taken to the Brahms style, this style is never commonplace ; it is always refined, always broad and noble, and at times philosophical. Personally we regret that this composer has done nothing for the young student ; for his pianoforte and chamber-music compositions one and all require a mature musical intelligence and an advanced technic.

The full list of chords, according to the above classification, would present what in current systems of Harmony and Thorough Bass is called the *material* of Harmony. There would be no objection to the current methods of taking up and treating this *material* little by little, if students were sufficiently trained in intervals, if they were required to do their work mentally, and if their work in Harmony consisted in elaborating a musical thought of their own conceiving. But as the student is not brought up in this manner, he is in no way prepared to meet the customary requirement of treating full chords in four voices, for indeed he does not even know how to treat a single voice. Hence it became necessary, in order to manage harmony at all, to begin by treating chords in couples and observing how one chord resembled or differed from another, how one chord acted on another, and by this procedure to establish rules as guides to students, and to provide given basses on which the student mechanically learns to build the chords to be treated. But unfortunately the rules only apply to particular cases and have to be modified or excepted, and ultimately many of them are entirely discarded.

Take the given bass away from the student and you deprive him of his only guide and comfort, you take away the only ground upon which he has a firm foothold. Without the given bass and the rule which provides for the retention of the *common tone* in the same voice, the beginner in Harmony would be irrevocably lost in despair.

The given bass and the common tone rule work well enough for a short time, but when the student arrives at the point where he himself must supply the ground-bass and where exceptions to the common tone rule have to be made, then the real struggle begins. To be told one day that a thing is right ; to be told a few days later that the same thing is wrong ; to be compelled to learn precepts

that have no logical explanation, and to adhere to them without knowing the reason why ; to accept complacently the ultimatum of one's teacher or text-book without question or be called a dunce : are things not calculated to encourage the music student. Yet these things and conditions exist everywhere and the most earnest students and musicians feel the burden keenest.

That the given bass custom of treating the material of Harmony must of necessity lead to purely mechanical work on the part of students is obvious, and I have not yet met the musician who does not admit that a radical change in the treatment of Harmony is a pressing need. Practical experience has given me every reason to believe that what has been described as a central thought and its harmonic elaboration is a step in the right direction. Musicians are certainly agreed that pupils must hear, must think, must reason, in short, must use their own heads, although there may be those who object that logic does not enter the domain of music, and with some cause perhaps.

Call a central idea what you please, a melody, a *melos*, a subject, a theme, a *cantus firmus*, or a *motif*, it always takes form in consciousness as a Prominent Voice with elaborating voices. Whether we hear its concomitant voices or not, the *melos* is prominent in the mind. Thus in making our first sketch of a musical thought we jot down the Prominent Voice ; the development and elaboration of the thought into harmony and form is a later process. Beethoven's sketch-books and those of other masters furnish the best evidence that such is the case.

The examples of keyklang-harmony thus far given show plainly that the average student is well equipped by nature to treat harmony, so long as he has a Prominent Voice. This Prominent Voice, or central thought, may be extremely simple and consist of two or three steps, as we have seen. Therefore why should the work of a student differ in kind from that of the great composers : certainly the difference in degree has been pointed out plainly enough. The natural musician sings a second voice to the melody of another ; the melody generates this second voice in his mind. The cultivated musician is in the habit of thinking several voices concomitantly. What is the difference in the mental operations of the two cases ? None whatever in kind, but an immense difference in degree. Both hear and feel ; the former is guided purely by instinct, while the latter discriminates ; the former does not know the tone relations, the latter does.

It is a principle of expression that the central idea, or *melos*, must be prominent; if we miss the *melos*, we miss the whole; if we do not comprehend the *melos*, we do not comprehend the whole. I have already pointed out how completely one and the same chord is changed each time we change the Prominent Voice from one of its tones to another. A few pages back this point was illustrated in single chords. The importance in musical conception and expression of the Prominent Voice and the subservient relation to it of all elaborating voices is more effectually presented in the following elaborated *melos*: **Ex. 167.**

How easily the *melos* might be distorted by giving undue prominence to other voices is heard in the following: **Ex. 168.**

Were there nothing else to condemn the *given bass* system of teaching Harmony, the one fact, namely, that this given bass as employed in current methods never represents a central idea, a

Prominent Voice, or *melos*, would be more than sufficient. Yet the given bass is the voice which a student is required to follow and to elaborate and is therefore of necessity the voice which is most prominent in his mind. This amounts to a complete reversal of the true order of things, for it practically teaches that harmony generates melody, which is not the case, for melody generates harmony, as everybody knows.

This provision of a bass is not only faulty at the outset, it completely separates the student from the real essence of harmony, it prevents him from exercising his musical faculties in accordance with the laws of natural development, it is therefore a most successful hindrance to the cultivation of an independent and intelligent musical mind.

The remedy is apparent: instead of giving the student a fundamental bass, let him find his own bass, and give him the liberty of using his own faculties; explain to him how a Prominent Voice, or *melos*, is conceived, by selecting models from the best masters; let him work out his own ideas, let him look into his own mind for the concomitant harmony of his *melos*. It is a matter of course that the student must learn to imitate the best models before he can form ideas of his own. By nature we are all simple melodists, our earliest love of music manifests itself as love of melody, the simpler and purer the melody and its rhythm and harmony the more do we enjoy it. This appreciation of simple forms of melody is the common end to which a musical environment stimulates and develops our inherited musical faculties; we attain to this end as children; therefore let education begin where nature leaves off, let education cultivate what nature provides so munificently. The significant importance of beginning music study with melody was recognized by A. B. Marx, whose treatises on music are still among the best in use.

What current systems of Harmony paradoxically call strict voice-leading is what this System calls thinking on the line of least resistance. In his *melos* the student will find the groundtones, or bass, and the remaining voices; the position and progression of his *melos* will regulate the positions and progressions of groundtones and other voices; the result will be a natural or an artificial harmonization and elaboration of the central idea. Natural harmony is anticipated, artificial harmony is unexpected; the former is simple, flowing, and pure, the latter is often a series of surprises and jerks; the former is often found in simple compositions by natural,

or untrained musicians, the latter is the product of schooled musicians; the former is never found in many highly-schooled musicians and yet we find it in embryo in musical children.

By no artifice can melody, harmony, and rhythm be separated. Current teachings are apt to lead the student to regard harmony as the material which, by observing certain rules, he may employ in dressing up melody. This causes the student to separate melody and harmony and helps to conceal from him the fact that every melody has a natural concomitant harmony, which he may find by reflection and introspection. The inseparability of the three factors of music in a simple phrase has previously been explained by the term *melo-rhythmo-harmonic phrase*. The *central thought*, however short it may be, and even though it contains but one short phrase of two or three steps, is a melody of some sort. The term *melody* should be used in a broader sense than the conventional one, namely, "a melody is a collection of musical phrases and periods in one voice," for in thought every bit of music is a bit of melody: this bit of melody is always a Prominent Voice, and comes under the head of melo-rhythmo-harmony. This explains why I defined intervals as the melodies of steps.

By studying the works of the masters of all epochs, we will find a complete record of the development of the musical faculties, we will find a complete history of mental evolution in music and of that practical music which alone concerns the musician. A careful and judicious selection of examples and models from these works, arranged in chronological and progressive order and culled from contemporaneous representatives of the schools of different nations, would supply the student with the most practical text-book on music and with the only text-book which he could comprehend *in toto*. Such a text-book would teach the language of music, its grammar, its development, and its history, in the most direct and appreciable manner.

As it is, the student is at present struggling with and is overwhelmed by multifarious rules and exceptions to rules: these rules are the immediate outgrowths of the *given bass* fallacy and the otherwise insurmountable difficulties that attend the handling of four voices at the outset. Never being sure of what he *ought to do*, the student struggles to avoid what he *ought not to do*; if he is tolerably successful in thus practically doing nothing, he is fairly contented, though he does not know exactly why; he is encouraged in the hope and belief that if he will but continue to persevere

long enough in the same way, somehow he will ultimately emerge from opaque darkness into everlasting light. However, when light does come, if it comes at all, it is long after the student has left school, and long after his shelved text-books are covered with the dusty coat of disuse.

In Chapter I. it was stated that the principles on which this System is based completely eliminate all the rules which in current systems so confuse and puzzle the student, or which, as we have seen, cause a student to work mechanically and without musical common sense. It now remains to demonstrate that what is known as *strict* and *pure* voice-leading is turned into *self-evident* and *matter-of-course* voice-leading by this System. I have already stated and substantially demonstrated that the Principles of Progression and Anticipation point out the keytrack to the student; that the line of the keytrack is identical with "strict" voice-leading; that the student of keyklangs follows the line of the keytrack naturally and therefore not because the rules command him; that it is easier for the student to follow this track, or line of least resistance, than to deviate from it.

In order to prove this beyond question, my purpose will be accomplished quickest and the above mentioned Principles will assert their validity most potently by meeting current systems on their own ground, namely:

1. By starting with threeklangs.
2. By treating these chords apart from a central idea, or *melos*: thus by simply observing the action of one chord on another.

As by this course of procedure there will be no *melos* to regulate the direction in which voices progress, the mind will hear each combination in its original key-relation, and in progression will follow the beaten keytrack, of which the Septonate and keygroup are the indexes of natural progression, in the First and Second Relationships respectively.

Threeklangs of the First Relationship.

The entire form of the tonal structure depends on the constitution of the basal unit of the System. This basal unit being the Septonate, it follows that the keygroup and stratum take their form according to that of the Septonate.

As the Septonate presents the seven principals in two scale-

halves in their natural order of sequence and in their most intimate relation to their key-center; as the position of each of its tones has been assigned to it by the Principle of Progression; as the Septonate is therefore the indicator of the natural direction in which tones progress in their fundamental key-relations; and as this unit presents tones in their First Relationship: it follows that our first view of threeklangs must be taken in the Septonate.

As tones are *individual*, as there are but *seven principals*, it stands to reason that we must first combine these *seven individual* principals within *one* stratum; and *not*, as is usual, introduce the tones of *another* stratum, according to the current plan.

The following example exhibits the primary and secondary threeklangs in the central Septonate of C: **Ex. 169.**

Primaries.			Secondaries.			
c.	o.	u.	o.	u.	o.	c.
I	u.IV	o.IV	u.III	o.III	u.II°	o.II

Thus it will be observed that within the limits of a single Septonate the *same seven individual* principals combine in *all* the threeklangs of the First Relationship, and as these principals all belong to the same key-center, and are of necessity in closest proximity and affinity, it follows that the threeklangs themselves are in closest proximity and affinity.

Again, because the position of each of the seven principals has been fixed by the principle of the direction of progression, it follows that the above combinations of these principals are subject to the same law.

Just as the Septonate is the progression-index of the seven principals, just so the Septonate is the progression-index of all combinations of these principals.

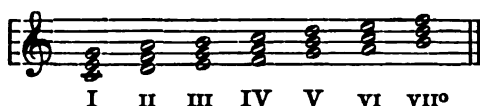
As the student of this System makes an early acquaintance with the harmonic relations of the seven principals as well as of the Principle of Progression, the relations of chords and the progressions from one chord to another do not puzzle him or bring up any serious difficulties; in a word, he is brought up on the keytrack and prefers to remain on it rather than deflect from it.

Thus when we consider the above Septonal threeklangs from a purely practical point of view:

1. We progress *down* from I to u.IV, because u.IV lies *under* I.
2. We progress *up* from u.IV to I, because I lies *over* u.IV.
3. We progress *up* from I to o.IV, because o.IV lies *over* I.
4. We progress *down* from o.IV to I, because I lies *under* o.IV.
5. We progress *down* from o.II to u.IV, because u.IV lies *under* o.II, etc.

Briefly then: *we move in the direction in which a chord lies*, and the Septonate presents each chord of the First Relationship in its original position.

For comparison with the Septonal threeklangs, I give below the current view of the seven threeklangs on the scale: **Ex. 170.**



While in their Septonal distribution these chords all appear in closest harmonic relation, in the above scale-distribution *not one* chord appears in any harmonic relation to another.

The fact that the scale does not present the seven principals in their original order, although substantially proved in preceding chapters, is exposed here still more plainly. For a moment let us grant that scale-stratification is correct, we will observe that the last four chords in the above example contain tones that belong to another scale-stratum; that the chords marked V and VII° have no relation to the initial Tonic chord, and so on. The case is not changed by doing in the scale what was done in the Septonate, namely, by combining the seven principals among themselves; these seven principals of the scale-stratum are thus combined as follows: **Ex. 171.**



It is useless to say that the chords V and VII° in this their *real* scale-position have no harmonic relation to the initial Tonic chord. As before, their chord-centers are related to another Tonic center, which is the initial tone of the next higher scale. Following is the

natural resolution of these two chords, and their real positions are indicated by the signs employed in this System. **Ex. 172.**



We may now continue our investigation of Septonal threeklangs.

As the position of each principal keyklang in the Septonate has been fixed by the Principle of Progression, as the Septonate as a whole presents its tones in their fundamental harmonic key-relations, we are under the sole stimulus of their harmonic key-relations when we think these tones in connection with one another; hence we lead a voice in the direction in which the position of a tone is indicated by the Septonal index.

When we combine these Septonal keyklangs in chords and think one chord in connection with another, we are under the same stimulus of their fundamental key-relation and lead the voices of one chord in the direction in which another chord lies, according to the Septonal index.

Although this sort of treatment apart from a Prominent Voice is unnatural and illogical, it is precisely what is done in current systems, and, as I said before, is done here with the sole view of demonstrating that the Septonal index of chord-progression and voice-leading is identical with what current systems choose to call *strict* or *pure* voice-leading, an end which these systems reach through a quantity of rules for voice-progression, an end the accomplishment of which is regarded as the fulfillment of the object of studying Harmony. Hence, in a word, the Septonal index represents pure voice-leading, and the student of the Septonate is brought up on pure voice-leading from the start and therefore *begins* his studies where the student of current systems *leaves off*.

Below the primary chords are connected according to the Septonal index. **Ex. 173.**



2. a) c. u. c. b) o. o. o.
I o.IV I I o.IV I

3. a) u. o. u. b) o. o. o.
o.IV u.IV o.IV o.IV u.IV o.IV

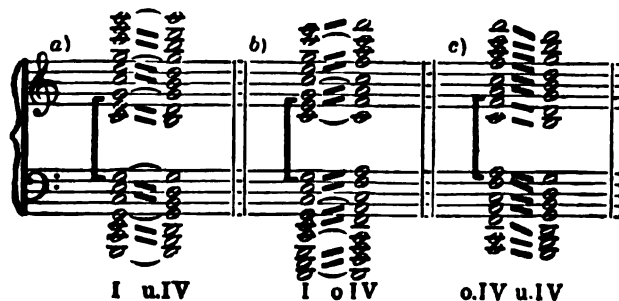
Both in *a*) and *b*) in each of the three divisions of this example the voices are led on the keytrack in perfect accordance with the Septonal index. In each division of this example the natural ground voice, or bass, is added to the Septonal threeklangs, and all these examples present the precise result in voice-leading which current systems mean to accomplish with all their rules. It is plain that the student of this System, who is brought up on the Principle of Progression and on keyklangs, leads the above voices up or down on the keytrack as a matter of course and requires *none* of the current rules for retaining common tones, and for avoiding consecutive fifths and octaves.

I maintain that if we desire to learn the harmonic inter-relations of keyklangs, we must first consider the seven individual principals of one Septonal family in the *central* stratum. Each keyklang having a characteristic effect peculiar to itself, the obvious way to observe and learn how the individual effects of the family of seven vary in consonance and dissonance is by associating them in all their possible relations in combination. In this way the student hears how the Tonic interblends with $\frac{1}{4}$ and $\frac{3}{4}$, with $\frac{4}{3}$ and $\frac{2}{3}$, with $\frac{3}{2}$ and $\frac{2}{1}$, how the Tonic dissonates with $\frac{5}{3}$ and $\frac{3}{1}$: and so he goes on mentally combining the other principals in order to observe their respective consonant and dissonant relations, and does not trespass outside of the central stratum. The student can without difficulty do this with a single Septonate, the small number of tones being easily commanded. According to current systems, however, the number of tones is too large and they admit of too many combinations; not being able to command them, the student has to depend on the rules, and he works like a machine.

The combinations in the central Septonate once mastered, the student learns that the index of Progression in the central Septo-

nate and stratum holds good for *all* Septonates and strata. To be explicit: granting that the same chords are related, the DIRECTION in which voices PROGRESS in the central Septonate and stratum is the SAME in ALL Septonates and strata.

The following example embraces a sufficient number of strata to illustrate that the progression of all the voices in the primary chords is the same in all strata: Ex. 174.



In whatever position in close or open voicing these chords may occur, their voices are led in accordance with the Septonal index, as follows: Ex. 175.

1. a) b) c) d) e) f)

I u.IV

2. a) b) c) d) e) f)

I o.IV

3. a) b) c) d) e) f)

o.IV u.IV

By adding the natural groundtones, which are the octaves of the chord-centers, to the above examples, the result would again

present what current systems paradoxically call strict voice-leading, for in this System the above voice-leading is the student's first choice and is what I call natural and self-evident voice-leading.

The half-steps $\bar{2}-1$ and $\bar{3}-4$ are explained and treated by this System as follows :

In *one* Septonate there are *four half-steps* : taking the central key of C for our illustrations, these four half-steps are as follows : **Ex. 176.**



In *a*) of this example the progression $\bar{2}-1$ places *b* in the relation of a leading-tone to C. In this relation I name *b* ($\bar{2}$) an *up-leader*.

In *b*), the *up*-progression $\bar{3}-4$ places *e* in the relation of a leading-tone to F. Therefore, in this relation I name *e* an *up-leader*.

In *c*), the progression $1-\bar{2}$ is the reverse of that in *a*), and C in this relation I name a *down-leader*.

In *d*), the progression $4-\bar{3}$ is the reverse of that in *b*), and F in this relation I name a *down-leader*.

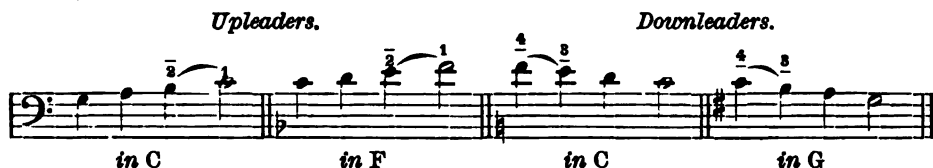
Hence a Septonate contains *four leading-tones*: two upleaders and two downleaders.

The familiar term *leading-tone* does not answer all purposes, for it applies only to one relation, as seen in *a*) of the above example, where *b* is *positively* a leading-tone : however, in the reverse relation (see *c*) in the above example), *b* is *not* a leading-tone.

Thus only the first of the above four leading-tones is recognized by current systems, and the fact that $\bar{2}$ is a leading-tone *only* when it is relationed with 1 has also been overlooked.

As these four half-steps represent four entirely dissimilar relations, moreover the simple fact that these four half-steps exist in the First Relationship and in one Septonate, renders their above definitions and designations both essential and logical. Besides, this distinguishing between and pointing out of these four half-steps among the seven principals supplies another important link in the chain of simplification, for the reason that these upleaders and downleaders are valuable guides to the student in his observations of the harmonic relations and progressions in one key as well as of the harmonic inter-relations of keys. This last point will be considered later : one illustration will suffice here.

In Chapter III. we saw how three keys enter into the composition of a single key, and how, in analyzing separate scale-halves, the terminals are always apperceived as Tonics. Hence in rising halves an *upleader* precedes the Tonic: in falling halves a *downleader* starts the series. Thus the half-step $b \text{--} C$ in the key of C is identical with the half-step $e \text{--} F$ in the key of F ; the half-step $F \text{--} e$ in the key of C is identical with the half-step $C \text{--} b$ in the key of G . The examples below illustrate these points in the order of their mention: **Ex. 177.**



There is a similarity between upmediates and upleaders, and between downmediates and downleaders, which will be discussed in Modulation.

Thus in **Ex. 173** the student of this System, while combining the chords $I \text{--} u.IV \text{--} I$ apperceives C as a downleader, and b as an upleader; in the chords $I \text{--} o.IV \text{--} I$, he apperceives e as an upleader, and F as a downleader; in the chords $o.IV \text{--} u.IV \text{--} o.IV$, he apperceives C as a downleader, and b as an upleader: therefore in such abstract chord-connections he would never think of leading the voices in any other way.

From the standpoint of purely harmonic Progression these upleaders and downleaders and the upmediates and downmediates are the most powerful agents to excite the motion and the direction of voices, and therefore the voices on these tones carry other voices into the harmonies the anticipation of which these progression-tones call forth.

The under-Dominant-Seventh chord furnishes a fair example of the powerful excitation to motion which is wrought by the coincidence of an upleader and a downleader: the student of this System requires none of the familiar rules for the resolution of this chord, for, being brought up on the Principle of Progression, his apperception of the combined forces of upleaders and downleaders is so vivid as to render error in voice-leading impossible. The example below presents coincidences of upleaders and downleaders: **Ex. 178.**



Combinations of upmediates and downmediates have an equal potency to stimulate the natural motion and direction of voices, and the student of Progression likewise needs no rules for their proper treatment. Although these chords belong to the Second Relationship, a few are given below as provisional illustrations: **Ex. 179.**



In these examples it will be observed that I have not only combined upmediates and downmediates but have also combined upleaders and downleaders together with these intermediates. Here the similarity of upmediates and upleaders, of downmediates and downleaders, to which reference was made a moment ago, is made plain. Besides, the great practical and æsthetic value of the Principle of Progression asserts itself here more forcibly even than it has hitherto, and the above examples demonstrate that the student of this Principle is even less likely to mislead voices while connecting chords of the Second Relationship than he is while connecting chords of the First Relationship; for the direction of voices in the former is of necessity far more acutely perceived by him than the direction of voices in the latter: the obvious cause of this being that the tones of the former are more dissonant and antagonistic than those of the latter.

It is worth mentioning here in further support of the fact that a Tonic is a central tone that in every Septonal stratum the *over* position, which is the *highest* position, of the chord u.IV is resolved *up* into the *central* position of the Tonic chord; that the *under* position, which is the *lowest* position, of the chord o.IV is resolved *down* into the *central* position of the Tonic chord: these facts verify beyond dispute my claim that a Tonic is a center and that the two Dominants lie a fourth over and under this center. **Ex. 180.**



Owing to the inconsequent rules of systems of Harmony, teachers habitually tell pupils that such a thing is permissible; such another thing is not permissible; this is right; that is wrong; this is natural, beautiful; that is unnatural, ugly; and in most cases pupils are left to guess why. To be sure, all systems work for the same end, for pure and strict voice-leading, but only the most impressionable and musical pupils succeed in intuiting what this means, for it really means nothing more or less than to lead a voice in the direction in which the combined tonal forces of any particular relation pull and push the voices. As the voices in chords are carried onward both up and down or are arrested, as the case may be, it is plain that some natural law of dynamics is in operation, and, although no pretence is made here to the discovery of exactly what this law is according to exact scientific methods, I have reason to believe that my definitions of rhythmico-harmonic Progression present the psychical counterpart and the expression of this law. For the reason that most music students at the outset do not possess a refined and experienced tone-sense, they imperatively need the guidance of proper principles and simple definitions. There being no exceptions to the Principle of Progression, and this Principle being explicable in simple and appreciable terms, there is no reason why the student should be precipitated into perplexities in the future, unless the baneful given bass practice and the severance of central ideas and Prominent Voices from the student's exercises continue to be stubbornly adhered to. If students are provided with basses, they are provided with that with which they individually should provide themselves and are robbed of the very education and exercise of faculty for which they are supposed to work. If the music pedagogue obstinately continues to teach Harmony apart from the development in his pupil of central ideas and of the elaboration of such ideas, he persists in misrepresenting the study of Harmony, and his course is practically condemned by standard music literature from beginning to end.

The scale-halves are ever a great help to the student of this System in enabling him to locate the relative positions of tones, intervals, and chords, and pointing out to him the natural direction

of voices. Thus he observes that threeklangs in close voicing have their component keyklangs distributed in two scale-halves, two of its keyklangs appearing in one scale-half, and one of its keyklangs appearing in another scale-half: the component keyklangs of threeklangs in open voicing are observed in the same manner, the student knowing exactly in which scale-half each occurs. The value of such a guide, by which it is rendered easy to follow voice-progressions, to observe when voices remain in one scale-half or cross over to another, cannot escape the notice of the practical teacher.

A few remarks concerning the common tone rule may be made here. The keeping of this common tone in the same voice is not made a rule in this System, indeed it cannot be made a rule for many reasons, three of which may be given:

1. Because this System does not recognize any efficient purpose in treating chords apart from a Prominent Voice.

2. Because the Prominent Voice may at any moment cause such a common tone rule to be broken, for the Prominent Voice regulates the current of its elaborating voices. Examples will be given presently to prove this point.

3. Because of all the voices in a chord, the common tone, just because it is the common tone, may be treated more freely than the other voices; these other voices must *positively progress*, for which reason their treatment admits of no alternative; while, on the other hand, the common tone may or may not be retained, according to the relation in which it occurs.

The keeping of the common tone in the same voice is one of the few things that the student of current systems understands; in connecting chords, he is educated to look out for this point of connection, and hence this rule is his first thought and care. All musicians will remember how as students they depended on and clung to this common tone rule and with what a sense of confidence and conviction of doing the proper thing they marked the ties in conformity with the rule and then proceeded to consider how the remaining voices were to be managed. No musician can question the fact that the *eye* has far more to do with this custom than has the *ear*.

The student of this System retains the common tone as a matter of course, *but only when the Prominent Voice does not lead the elaborating voices beyond the limits of the scale-half and stratum in*

which they start. Hence the retention of the common tone is not made a rule, nor can this be done.

The student of this System uses the common tone preëminently as a guide in observing the relations of chords: this he does mentally by observing the wonderful change in the effect of a keyklang which is wrought by thinking it in different combinations. The common tone tables which are given later on will show the practical side of this point.

For the present, the Septonal index suffices to explain why the common tone is retained in the examples of primary threeklangs thus far given.

A word concerning the connection of the chords o. IV—u. IV, in which there are no common tones, is worthy of a moment's attention. It is here that the student of Harmony is first told to look out for and avoid *consecutive, or parallel, fifths and octaves*, and is exhorted to lead voices in *contrary motion* to the given bass, and from the moment that he begins to treat chords his mind is set on avoiding *parallel* and so-called *covered* fifths and octaves. How this sort of vigil tends to hamper and worry a student and how it compels him to work mechanically, are points too obvious and facts too familiar to require further comment. The Septonal index forever removes these incumbrances, and the Principle of Progression renders these avoidance-rules superfluous. Again, the Principle of rhythm-harmonic Progression once understood, the student need never hear of such dreadful things as *covered* fifths and octaves, for this Principle in itself obviates the possibility of thinking and writing objectionable covered fifths and octaves. This point may be illustrated by considering the connection of the chords o. II—u. IV (*current systems: II—V*). These chords are given below in accordance with the Septonal index, and I have selected them because the avoidance of covered octaves and the exception to the common tone rule in this particular case always perplex the student. As was shown previously, the voices of chords are led according to the Septonal index, in whatever position they may occur. **Ex. 181.**

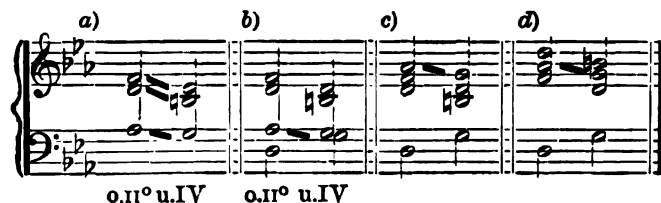
o. II u. IV

These examples show the natural direction of the voices and plainly demonstrate the validity of the Septonal index. The student of this System adds the natural groundtones, and the result thus obtained is exactly what current systems desire and try to reach by means of puzzling rules ; as seen below : **Ex. 182.**



As this System does not make the retention of the common tone a rule, the above chord-connections render the customary explanations and the perplexities to which they give rise entirely superfluous.

The same case is presented below in the *minor* mode. Besides trying to explain why the common tone should not be retained and warning the student to avoid covered octaves, current systems find a new difficulty here and rigorously prohibit the student from making the possible step of the augmented second $a \flat - b$. For the reason that the student of this System recognizes in $a \flat$ the *down-median* \flat , he leads a voice in this relation from $a \flat$ down to G and would never think of doing anything else ; indeed, his sense of the relations of tones and his appreciation of the Principle of Progression and of the keytrack make him proof against faulty voice-leading. **Ex. 183.**



Innumerable other cases might be brought forward here in further verification of the fact that what has hitherto been known as *strict* voice-leading is precisely what I call *progressing on the keytrack*.

The scale of seven principals, which is the basal unit on which all past and current systems rest and from which they start, does not trace the fundamental line of the keytrack, and therefore the

end for which the student of current systems of Harmony works is to learn what progression on the keytrack really means.

The Septonate, which is the basal unit of this System, is the fundamental index of the keytrack itself, and therefore the student of this System is started on the keytrack, fully appreciates what the keytrack is, progresses on the keytrack as a matter of course, and hence begins his studies at the point where the student of current systems is supposed to have accomplished the end.

As the scale of seven tones does not present the seven principals in their natural order of sequence or in their fundamental key-relations, the necessity for the customary treatment of Harmony apart from a central thought, or Prominent Voice, the necessity for manifold rules and exceptions to rules, the distinctions which had to be made between *strict* voice-leading and *free* voice-leading, and other points now present themselves in a light wherein they are rendered explicable. Thus what is meant by *strict* voice-leading is *strict adherence to progression on the keytrack by relating chords by themselves and therefore apart from a thought, or Prominent Voice*: what is meant by *free* voice-leading is represented by standard composers in their works where the musical thought, or Prominent Voice, reigns supreme and places all elaborating voices in a subservient relation to it. Thus the student is compelled to learn *strict* voice-leading before he can be permitted to embark in *free* voice-leading, or he will be sure to run off the keytrack. This is hard and discouraging, for it teaches that liberty cannot be appreciated until we have undergone the severe discipline of a series of semesters in prison. Unfortunately this imprisonment too often unfits us mentally for anything like an appreciation of liberty when liberty really does come.

However: since, in establishing the Septonate as the basal unit in music, the scale-halves are of necessity conceived as Prominent Voices and central ideas, and since their concomitant harmony is the fundamental harmony in music, there is no reason why students should continue to work mechanically or work without a Prominent Voice; since this System starts and keeps the student on the keytrack, since this keytrack itself represents what is called *strict* voice-leading and therefore converts such *strict* voice-leading into natural and self-patent voice-leading, there is no reason why students should continue to be harassed with inconsequent rules, the only excuse for whose existence is now removed. Until we obtain adequate text-books and a music-science worthy of the

name, let the music student study the most efficient text-book and the one from which the masters themselves learned most, namely, music-literature. Let teachers select and methodize for purposes of instruction the best models from standard works on the plan already suggested in these pages. Bach was a greater musician after copying the works the possession of which he so craved, in spite of the fact that the result of his arduous work was so soon taken away from him and destroyed. Wagner's profound and clear insight into and love for Beethoven's Symphonies were not derived from school-books but from Beethoven's scores, which, it is said, Wagner copied note by note from memory in order to assure himself that he knew every note.

Although what has been said explains why the rules of current systems are untenable and so often have to be excepted, the key of the mystery lies in the fact that a Prominent Voice, or central idea, may cause all the current rules for voice-leading to be broken, for the Prominent Voice, being the principal voice, directs the current of its elaborating voices. In the following example the common tone rule is broken in the first and fourth measures: the leading-tone rule is broken by the Prominent Voice in its progression from the third to the fourth measure: **Ex. 184.**

P. V.

I u.IV I o.IV I u.IV I u.III u.IV

Yet in all this rule-iconoclasm no one can discover anything that is not perfectly correct and in unquestionable accord with natural voice-leading.

Were I to stop here for illustrations from standard musical works the greatest heresies in the light of current rules would be disclosed; parallel fifths and octaves, unprepared sevenths, augmented steps, etc., are recorded in abundance, and even the great diatonic Bach indulged in consecutive fifths when it pleased him to do so.

As the student of this System first practices the chords of the First Relationship and enjoys the guidance of the Principle of Progression and Septonal index, it will be observed by the in-

structor who puts this System to a practical test that pupils are safely guarded against faulty and unnatural results. The First Relationship necessitates diatonic voice-leading and is therefore calculated to cultivate a taste for purity of style and therefore for the music of Bach, which, with Schumann, every true musician must concede to be the best food for the development of the student's musical mind. When it comes to practicing the chords of the Second Relationship, it is obvious that, since the leading of voices on upmediates and downmediates is rendered such a matter of course by the Principle of Progression, students cannot easily deflect from the keytrack and hence from natural voice-leading.

The examples of threeklangs thus far given render it unnecessary to enter into details concerning the remaining secondary chords. The dissonant threeklang $u. 11^o$, when it is resolved on the keytrack apart from a Prominent Voice, has been explained, the progression of its component upleader and downleader being self-evident: yet a Prominent Voice may cause these voices to be led differently, as everything depends on the constitution of such a Prominent Voice.

This System points out the relations of these threeklangs by observing those which have common tones and those which have no common tones, as follows:

1. Threeklangs the relative position of whose chord-centers are equivalent to the steps $1-\frac{4}{4}$ and $1-\frac{4}{4}$ have *one* common tone.
2. Threeklangs the relative position of whose chord-centers are equivalent to the steps $1-\frac{3}{3}$ and $1-\frac{3}{3}$ have *two* common tones.
3. Threeklangs the relative position of whose chord-centers are equivalent to the steps $1-\frac{2}{2}$ and $1-\frac{2}{2}$ have *no* common tone.

My pupil is required to write out and learn the tables which correspond to the above three heads as follows: **Ex. 185.**

One Common Tone.	{	Table 1.
		$\frac{4}{4}-1-\frac{4}{4}$
		E—A—D
		F—B—E
		G—C—F
		A—D—G
		B—E—A
		C—F—B
Two Common Tones.	{	Table 2.
		$\frac{3}{3}-1-\frac{3}{3}$
		F—A—C
		G—B—D
		A—C—E
		B—D—F
		C—E—G
		D—F—A
No Common Tone.	{	Table 3.
		$\frac{2}{2}-1-\frac{2}{2}$
		G—A—B
		A—B—C
		B—C—D
		C—D—E
		D—E—F
		E—F—G
		F—G—A

These tables of threeklang relations are employed for mechanical drill in observing common tones, and moreover, for the same purpose as were the tables of letters in the preceding chapter ; for whether the letters that represent chord-centers are \sharp , \flat , \times , b , or bb , these tables answer the same purpose of showing which chords have common tones, and which have not.

The fact that everything depends on a central thought, or Prominent Voice, having been plainly demonstrated, the uselessness of the common tone rule, of the rules that we must move *up* on a leading-tone and *down* on a Seventh, that Sevenths must be prepared, and so on, is manifest, for the Prominent Voice may cause all such rules to be violated. There are far more important matters to be observed, namely, rhythmical and dynamical accents, to which more attention will be paid in the succeeding chapter and which account for the perfect correctness of such harmony as the following, even though conventional rules are ignored and broken :
Ex. 186.



The above conception in $\frac{5}{4}$ measure suggests the remark that the keytrack in the First Relationship is by no means used up or antiquated : although combinations in this First Relationship are limited in number, rhythmical variations are practically unlimited, and this powerful factor of music lies in wait for higher development than it has hitherto received. Tones and their harmonies are limited, but every rhythmic variation gives to the same series of tones an entirely new melodic and harmonic character. It is in this province of rhythm that such wonderfully beautiful harmonies were generated in the mind of Wagner, for these harmonies are inherent in his central ideas, or Prominent Voices, to whose rhythmical accents their natural genesis is to be ascribed. Although Schumann would, as he said, have "boxed the ears of the pupil" that would dare to place before his judicial eye "such a heterogeneous series of chords as open the Tannhäuser Overture," nevertheless any other harmony would completely distort this

lovely "Pilgrims' Chorus", and therefore Wagner's harmonization in this case is perfectly pure and natural. In the mind of a true master conceptions are synthetic, therefore melo-rhythmo-harmonic; in other words, melody, rhythm, and harmony arise in his mind in a single fount, and so it was with Wagner and his remarkable complex conceptions.

A few pages back I alluded to the fact that chord-centers are heard even though they are not sounded and do not appear in a musical context. The fact that a series of keyklangs in one voice generates a concomitant harmony renders this point obvious. However, this is the case even when we contemplate chords that are abstracted from any Prominent Voice. A few examples follow to illustrate this case in the Tonic chord: **Ex. 187.**



Like the above Tonic chords, any other chord may appear without its chord-center. Hence, a chord may be represented by any one, or any two or more of its component keyklangs.

Consonant and Dissonant Chords.

Major and *minor* chords are consonant chords.

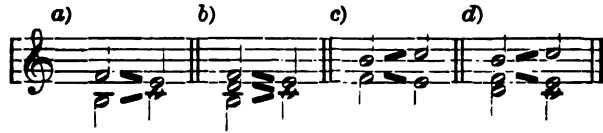
All other chords are dissonant chords.

Consonant chords, by themselves, fill the mind with a sense of repose. This repose is due to the balance and agreement of the keyklangs in these combinations.

Dissonant chords, by themselves, stimulate the mind to progression and resolution into consonance. This stimulus to progression is due to the disagreement and antagonism of the keyklangs in such combinations.

With the exception of the chord u. II^o, the threeklangs of the First Relationship are consonant chords.

The dissonant threeklang *u. II°*, when thought by itself, calls for resolution into the Tonic chord, and this is due to the coincidence of the upleader and downleader. **Ex. 188.**



While the other six threeklangs of the First Relationship contain their natural harmonic chord-centers, this dissonant threeklang does not. Again, while the other six threeklangs generate in the mind replicates of their component keyklangs in higher and lower strata, this dissonant threeklang does not generate higher and lower octaves of its components until its *natural harmonic chord-center* is added. What is this chord-center? It is the first under-tone which this threeklang generates in the mind; by keeping this threeklang before the mind, the under-tone *G* will be heard distinctly, as follows: **Ex. 189.**



It is therefore obvious that the threeklang *u. II°* is a part of the dissonant *fourklang* *u. IV7*, or of what is known as the Dominant-Seventh chord. This point will be still clearer presently, when the *dissonant harmony* of a chord-center will be analyzed.

The fact that this diminished threeklang so frequently occurs, the further fact that such diminished threeklangs may be formed on each of the *seventeen* tones of the keygroup, and the fact that classification renders accurate description of all combinations imperative, make it necessary to treat this diminished chord like others and to regard the tone on which it is formed as its chord-center.

Although the three primary chords *I*, *u. IV*, and *o. IV* are major chords and are therefore identical with what was named the perfect physical harmony, only *one* of these chords fills the mind with a sense of perfect repose when the three are relationed in one key, and this one is of course the Tonic chord. The following harmonic dialogues illustrate this fact: **Ex. 190.**

a)

I o.IV u.IV I u.IV

b)

I o.IV u.IV I u.IV o.IV I

In **Ex. 169** it was observed that the threeklangs of the First Relationship consist in six consonant chords and one dissonant chord.

According to my classification of chords, the chords of the *Second Relationship* include all combinations of *principals* and *primary intermediates*, and of *primary intermediates* and *primary intermediates*. As the keygroup contains *seven* principals and *ten* primary intermediates, there are *seventeen* keyklangs on which chords may be formed; therefore there are *seventeen* chord-centers in *one* key. The large number of chords that belong to the *Second Relationship* present a quantity of consonant and dissonant combinations which are commonly regarded as belonging to other keys, but which, for reasons already stated, I include in one key. It would be more correct to say that although theory has hitherto maintained that these chords belong to other keys and introduce "foreign" tones, practical music in the compositions of the masters has always included them in one key.

My classification plainly indicates what chords belong to this *Second Group*, and, although space does not permit me to present them in full, some idea of the scope and wealth of harmony in *one* keygroup may be obtained from the following array of the *consonant* chords of the First and Second Relationships: we will first consider the consonant chords in which the *seven principals* appear; all chords will be presented in the central stratum.

The keyklang 1, or central Tonic, is common to the following consonant chords: **Ex. 191.**

<i>First Rel.</i>	<i>Second Rel.</i>
<p>I o.IV u.III</p>	<p>I o.IV u.III^b</p>

We may now view the consonant chords in which each of the ten *primary intermediates* appears as common tone. This will bring to view some of the consonances of the *Third Relationship* and will therefore introduce *secondary intermediates*. The *primary intermediates* are given in their two groups: 1. Upmediates; 2. Downmediates.

Like the chords in the above seven examples, those following are presented in closest proximity within the limits of the central stratum.

The next examples present the *five upmediates* in all the consonant chords in which they occur: the keyklang number and sign for each upmediate is marked at the left of each example. **Ex. 198.**

<i>Second Rel.</i>				<i>Thtrd Rel.</i>			
1#							
4#							
4#							
3#							
2#							

In the same manner the consonant chords in which each of the *five downmediates* occurs as common tone are shown below: **Ex. 199.**

Second Rel.				Third Rel.			

The large number of consonant chords in the above nine examples, all of which together with their chord-centers appear in the central stratum in closest proximity and affinity, each of which is plainly and logically described as belonging to one of the Three Relationships, suffice to point out not only how many major and minor chords may be combined out of the same individual keyklangs of one stratum, but they also demonstrate to what great extent the observation of the relations of chords is thus simplified. Moreover, as these consonant chords are here included in a single key, the above examples point out how closely all keys are related; this point will be considered more carefully in the next chapter.

As in this writing anything like didactic treatment must be avoided, many important practical questions suggested by the above examples must be omitted.

The consonant threeklang is the *typical consonant chord*, and every consonant twoklang, like such a threeklang, is apperceived and must therefore be described as part of the *full harmony* of a chord-center.

We shall see presently that the *fourklang* is the *typical dissonant chord*.

The foregoing examples show that every keyklang combines with other keyklangs in two consonant chords, namely, a major chord and a minor chord. Hence each keyklang is the chord-center of two consonant chords.

The Dissonant Harmony.

Every keyklang combines with other keyklangs in a variety of dissonant chords. Therefore every keyklang is the chord-center of dissonant chords. Before the exact constitution of the dissonant harmony can be explained, a nice distinction must be made between *two* classes of dissonances. I distinguish between these two classes of dissonances as follows :

1. The *bytones*.
2. The *dissonant harmonics*.

As has been explained, *bytones* antagonize a chord-center and its harmony ; they lie a step and half-step over and under the harmonics of a chord-center ; *they are resolved into these harmonics of a chord-center ; they do not change the character of this harmony ; when they are resolved, no change of harmony is anticipated.*

The *dissonant harmonic*, on the other hand, *is not resolved into the harmony of the chord-center which it antagonizes ; it completely changes the character of the harmony of a chord-center ; it at once transforms a consonant harmony into a dissonant harmony, and at once excites a progression to the harmony of another chord-center.*

Briefly, the *dissonant harmonic* is a component part of a dissonant harmony, while the *bytone* is not a component of any harmony, whether the harmony is consonant or dissonant. It therefore follows that a bytone antagonizes and is resolved into both consonant and dissonant chords.

A few examples will clear up this important point.

In the following examples the dissonant keyklangs are *bytones* ; they are resolved into the chord which they antagonize, but do not disturb the character of the chord itself. **Ex. 200.**

a)

b)

Thus while the bytone is resolved into the chord which it attacks, the *dissonant harmonic harmonizes* with the chord and is therefore a *component* of the chord. Following are chords with dissonant harmonics: **Ex. 201.**

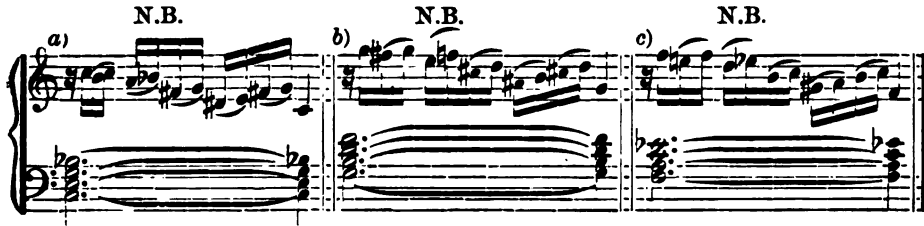
a)

b)

c)

The dissonant keyklangs $b\flat$ in a), f in b), and $e\flat$ in c) are *component parts* of the chords in which they appear for the obvious reason that they are not resolvable into these chords: therefore they are dissonant components of a chord, or simply, *dissonant har-*

monics. Being harmonics, these dissonant harmonics, like the harmonics of consonant chords, have their *bytones*, as shown at N. B. in the example below : **Ex. 202.**



The difference between a bytone and a dissonant harmonic being explained, no confusion can result from the paradox which appears in the association of the terms *dissonant* and *harmonic*.

When these chords are conceived as belonging to separate keys, the dissonant harmonic in each is a downleader: when they are conceived as belonging to *one* key, the key of C, then the dissonant harmonic *f* is the only downleader, and *e♭* and *b♭* are downmediates. Thus the dissonant fourklang u.IV₇ is the only one of the three chords in the above example which arises in the First Relationship; the other two belong to the Second Relationship.

The three primary chords of the First Relationship represent the fundamental harmony of the Septonal System; in other words, the primary chords unite the seven principals into a perfect whole and are the basal harmony of the key. As each tone in the Septonate appears in its primal key-relation and as the term *keyklang* implies a relation and a harmony as well, therefore when we relation one keyklang with another we are in reality relationing the harmony of one keyklang with that of another. Thus when we think the Septonal keyklangs, each is thought in its primal key-relation and is apperceived as *a component of one of the three primary chords*.

In this primal key-relation *but one of the Septonal keyklangs generates a dissonant harmonic in the mind*. This keyklang is the under-Dominant, and its primal key-relation and key-harmony is indicated by the chord-centers u.IV—I, as follows : **Ex. 203.**



In Chapter III. it was explained that the natural groundtone and chord-center of *F* in the falling scale-half was the under-Dominant *G*. This becomes plain now, inasmuch as *F* in this relation is a *downleader* and is resolved into *e*, the third of the Tonic-harmony. See *a*) in the above example.

Because this is the first and only dissonant harmony that has a natural genesis in the First Relationship, I name it the *typical* dissonant harmony, and employ it as the model by which to build all other dissonant harmonies. Why this typical dissonant harmony is a fourklang will be considered presently.

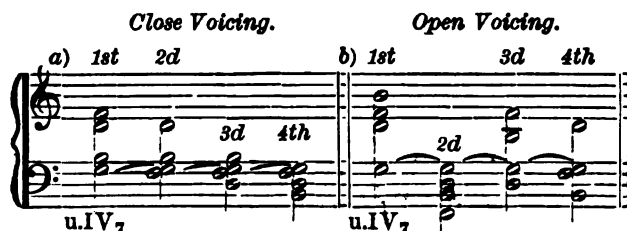
In the Second Relationship the other principals and primary intermediates generate the typical dissonant harmony when they are thought in a similar relation to that of the downleader *F* in *a*) of the last example. See below: **Ex. 204.**



The under-Dominant fourklang arises in the Septonate, reaching from one of its poles to the other: **Ex. 205.**



The keyklang $\bar{4}$ of every stratum is the chord-center of four forms of this chord in close voicing, and of four forms in open voicing. **Ex. 206.**



The numerals *1st*, *2d*, *3d*, *4th*, in the above example, apply to the four forms of a fourklang. I name the initial chord in this example the *first* form because it takes this form in its genesis.

The remaining fourklangs, known as *secondary* Seventh chords, are formed, named, and marked according to the fourklang *u.IV7*.

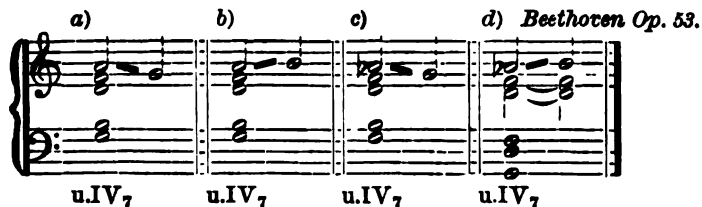
These remaining secondary fourklangs of the First Relationship are here presented in their Septonal position : **Ex. 207.**



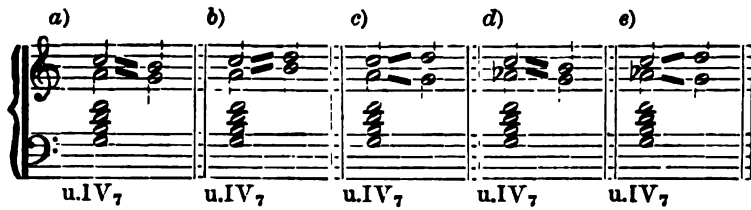
To stop to treat these chords individually would unnecessarily prolong this presentation. The character of a Prominent Voice, its rhythmical accents, the relations in which its tones stand to one another, determine the entire elaboration. Besides, in all such dissonant chords the Principle of Progression points out the direction of voices more plainly than ever. As all depends on the Prominent Voice, or central thought, this thought may be good, bad, or indifferent, and may therefore deserve the same criticism which Schumann bestowed on an idea of a contemporaneous writer in these words: "He says the same thing four times, and four times he says nothing." However, the student of music, to whose assistance this System proposes to minister in the main, is a composer in embryo only; yet a careful analysis and study of the models of the best masters in conjunction with the principles advocated in these pages are sure to develop any creative power that may lie dormant within him.

The typical dissonant harmony is a *fourklang* for the reason that all other dissonant keyklangs that may be added to this fourklang are *bytones*.

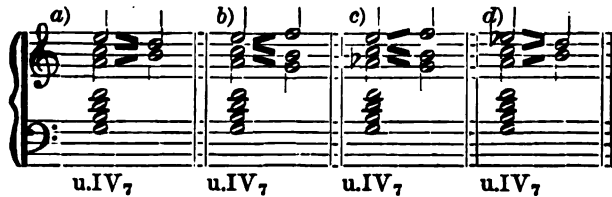
The dissonant interval in the following fiveklang, or what is known as the chord of the Ninth, is a *bytone*, because, on the line of least resistance, it is resolved into one of the components of the dissonant fourklang u.IV₇. This resolution may be down or up, according to the relation in which it is conceived. **Ex. 208.**



The same is true of the additional dissonant keyklangs in the sixklang, or chord of the Eleventh, both of which are bytones to the harmonics of the dissonant fourklang u.IV₇. **Ex. 209.**



The dissonant keyklangs in the chord of the Thirteenth are likewise bytones to the harmonics of the fourklang u.IV₇. Ex. 210.



The fourklang must be regarded as the typical dissonant harmony. The added *dissonant keyklangs* in the above examples stand in the same relation to the *dissonant fourklang* as do *bytones* to *consonant chords*. The *ninth* is not a dissonant harmonic like the *seventh* for the reason that the *ninth* is resolvable into the *same harmony* which it antagonizes, while the *seventh* is not. Like the *ninth*, the other dissonant keyklangs in the above examples are resolvable into the harmony which they antagonize, and are therefore not dissonant harmonics.

The fact that these dissonant keyklangs are resolvable into the fourklang does not mean that they *must be* so resolved. The fact that there is a typical dissonant harmony does not mean that there are no chords of the Ninth and Eleventh, or fiveklangs and sixklangs. Melo-rhythmo-harmonic inter-relations determine how these combinations are to be treated; and this System recognizes the existence of such chords as fiveklangs and sixklangs, as was seen in my classification of chords. Practically considered, every combination of two, three, four, five, or six *individual tones* is a chord of some certain denomination.

A tone being an harmonic center, it follows that *every tone in the System is the chord-center of all varieties of consonant and dissonant chords*.

To which Relationship such combinations belong is determined by the *key in which they are related*.

In view of the fact that all individual tones are incorporated in

this System, it is plain that *any tone and any combination may be relationed in any key.*

What the presiding key of the moment is, and when a change of key takes place, are matters that are determined by the melo-rhythmo-harmonic inter-relations in which a series of tones or chords appears. These inter-relations will be discussed when we treat Modulation.

Many important problems which directly bear on the present subject of harmony and which have been analyzed in my larger work, must be omitted here owing to the fact that the present writing has already been extended beyond the limits that I originally mapped out. I believe that the new aspect in which Harmony is placed by this System has been, if not fully, at least approximately described. I would have liked to have given a little more space to two-voiced and three-voiced Counterpoint, in order to emphasize the great importance which attaches to this style of writing. It is greatly to be regretted that compositions in this style are so neglected at the present time and that composers at present consider over-elaboration preferable to leaving something to suggestion. This subject merits more attention than can be given to it here. The compositions in two and three voices by Bach, Händel, Scarlatti, Rameau, Lully, Mozart, Haydn, and others speak eloquently on this point. Elaborations of some of Bach's music of this style would become almost Wagnerian in its harmony; no more consummate harmonist than Bach ever lived; no more devoted and appreciative student of Bach than Wagner ever lived. Indeed there are moments in *Die Meistersinger* and *Parsifal* which forcibly remind one of the great Leipzig Cantor's virile rhythmic and diatonic style.

Whatever may be said of the tendency to over-elaboration in modern composition, the modernization of old master-works is quite another question. To add a third when Mozart wrote an open fifth, to fill up the chords of Händel where the author chose to omit chord-centers and other components, and other like distortions, are not merely questions of individual taste. Such patching would appear in its true aspect of absurdity and bad taste were it applied to old master-works in literature, painting, and architecture.

A few words may be added here in explanation of the manner in which the accepted rules of current systems have been mentioned in these pages. This System is far from advocating the

breaking of such rules or any other rules. Nowhere in these pages is it stated: write as many parallel fifths and octaves as you please; do not retain common tones or prepare Sevenths; resolve Sevenths *up* and leading-tones *down*, whenever you choose to do so; write as many augmented seconds and other objectionable steps as you like; and so on. What I have endeavored to make plain in regard to the subject of voice-leading is simply this: that this System and the principles on which it is based teach pure voice-leading in such a way as to render these accepted rules superfluous.

CHAPTER VI.

SUSPENSION: CENTRALIZATION AND INTER-RELATIONS OF KEYS: MODULATION: CONCLUSION.

Suspension.

THE gist of what current systems intend to convey by means of more or less involved terminology in their various definitions of Suspension is about this:

A Suspension takes place when the resolution of one of the tones of a *first* chord is delayed beyond the point where a *second* chord enters.

The three stages in a Suspension are commonly known to be these:

1. Preparation.
2. Suspension; Suspense; Anticipation.
3. Resolution.

Here, as usual, current systems adopt the plan of abstract and mechanical treatment, and a couple of chords is selected for presentation and demonstration. The following examples are fair illustrations of the customary method of presenting this subject. I have added the letters P, S, and R, which indicate Preparation, Suspension, and Resolution respectively. **Ex. 211.**

a) P. S. R. b) P. S. R. c) P. S. R. d) P. S. R.

I u.IV u.III o.III I u.IV₇ u.IV₇ I

The implication in the above definition, namely, that one of the harmonics of a *first* chord is prolonged so as to sound along with a second chord is an obvious absurdity for this reason: at the very

moment when the *second* chord enters this tone ceases to have any relation whatever to the *first* chord, its relation having been changed to another chord. Again : while this tone appeared as an *harmonic* in its relation to the *first* chord, in its relation to the *second* chord it is a *bytone*. All the Suspensions in the above example illustrate this point.

Such Suspensions as the above, which present but one of many varieties of Suspensions, are analyzed by this System as follows :

1. Conceive a tone as an harmonic.
2. Mentally convert this tone into a bytone.
3. Resolve the bytone on the keytrack.

Hence the three stages through which a *voice* passes in such Suspensions as the above, are these :

1. Consonant stage : due to harmonic.
2. Dissonant stage : due to change of harmonic into bytone.
3. Consonant stage : due to resolution of bytone.

Thus in **Ex. 211 a**, the Soprano, in which the Suspension occurs, is subject to the following harmonic analysis : **Ex. 212.**



What current systems really mean by Suspension is explained by this System simply as follows :

Mentally convert any tone from an harmonic into a bytone; the invariable result is a Suspension.

The examples below prove this simple fact and verify beyond dispute my claim that Suspensions are conceivable, appreciable, and teachable, in *one voice*: the letters *h* and *b* indicate harmonic and bytone respectively. **Ex. 213.**



Hence this rule :

Change the relation of a tone from an harmonic to a bytone, and a Suspension is initiated. Resolve the bytone, and a Suspension is terminated.

This rule is good as far as it goes ; it does not go far enough, for the reason that it does not embrace all Suspensions and only

applies to those thus far considered, which represent but one of many varieties of Suspensions. Before other Suspensions can be discussed, it is important that the real nature of a Suspension should be more minutely analyzed.

Of the moments, or stages, in the above Suspensions, the *second* moment is the one to which the term *Suspension* alone applies: this second moment marks the point at which a change of harmony takes place; this second moment is coincident with a *rhythmical accent*; a voice at this second moment is always on a *bytone*; so long as the voice dwells on the bytone, so long is the voice in Suspension; at the very moment when the bytone is resolved, Suspension ceases. It is plain that a Suspension is intimately concerned with rhythmical accents and therefore with the Principle of rhythm-harmonic Progression. It is in this Principle that the true nature and essence of a Suspension are to be sought, and moreover this Principle furnishes a rule which applies to all Suspensions.

The actual moment of Suspension is a rhythm-harmonic point, for the reason that at this moment there is a concurrence of a rhythmical accent with a change of harmony. A voice that disturbs the rhythm-harmonic balance by prolonging a tone beyond such a rhythm-harmonic point is in Suspension. Briefly then, any delay in the resolution of a tone results in a Suspension.

Here we find a simple rule which applies to all Suspensions; it is this:

Delay the resolution of a tone, and a voice is in Suspension.

The term *resolution* in itself implies a tone to be resolved, a dissonant tone, therefore a tone that antagonizes a harmony.

The phrase *delay the resolution* implies that a tone is held over beyond the point where the harmony changes; as has been shown, a tone at this point is always a bytone, and this point where the harmony changes is coincident with a rhythmical accent.

This delay in the resolution of a tone may be long or short, and hence Suspensions may occur on the rhythmical accents of divisions of beats, of beats, and of measures; they may be extended indefinitely through a number of measures.

The example below presents Suspensions which take place on the rhythmical accents *between* beats: **Ex. 214.**



Suspensions on beat-accents follow: **Ex. 215.**



Suspensions on measure-accents have already appeared in **Exs. 211, 212, and 213.**

The next example presents Suspensions which are extended through several measures; coincident with each succeeding measure-accent there is a change of harmony; the tone in Suspension remains a bytone in its relation to each of the series of harmonies. **Ex. 216.**



The tone that is held over for Suspension need not be an harmonic, nor does a Suspension necessarily involve a series of two harmonies, or chords. The following Suspensions start with *by-tones* and occur in relation to but *one* harmony, or chord. **Ex. 217.**



Again, it does not matter on what beat of a measure or on what part of a beat the tone that is held over for Suspension starts. **Ex. 218.**



Nor does it matter on what beat of a measure or on what part of a beat Suspensions are resolved : this point is illustrated below :

Ex. 219.



That a tone must be held over for Suspension is a matter of course ; a tone in Suspension always being a bytone, it is self-evident that such a tone disturbs the harmonic balance and excites the anticipation for progression and therefore for resolution. Since the held-over tone may be either an harmonic or a bytone ; since it may start on, before, or after rhythmical accents of any denomination ; since resolution may be effected on, before, or after rhythmical accents of any denomination : it follows that no positive rules can be invented for these two stages in a Suspension known as Preparation and Resolution, without running the risk of confusing the student. As the exact nature of a Suspension is explained in the simple and logical phrase *delay of resolution*, as this phrase tells the whole story just as it is, and as this System makes it possible for students to learn and teachers to teach Suspensions in *one* voice : all the current talk about *arsis* and *thesis*, *suspending* tones, *suspended* tones, and the common method of demonstration by means of a couple of chords, cease to have any pedagogical or practical value.

Since a tone in Suspension is always a bytone, since, to the student of this System, a bytone means a progression-tone, since the student is in the habit of relationing both principals and intermediates as bytones and resolves these both up and down, and since he can easily relation several voices simultaneously on bytones, there is no reason why the subject of Suspension should offer any insuperable difficulties to music students in the future.

In resolutions of Suspensions the anticipated tone is often preceded by other tones, as follows : Ex. 220.



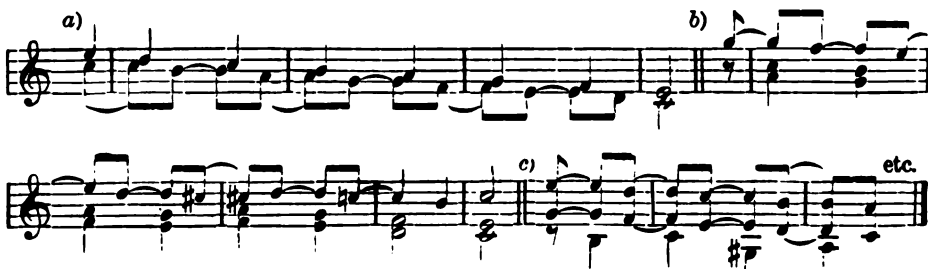
Or, the tone in Suspension, instead of being resolved into the anticipated tone, is resolved into *another* component of the antagonized chord, as seen at N. B. **Ex. 221.**



Or again, resolution into the antagonized harmony is entirely omitted. **Ex. 222.**



Chains of Suspensions occur very commonly in the form of sequences, as follows : **Ex. 223.**



These sequences are presented here for the purpose of pointing out plainly the necessary distinction that must be made between Suspension and syncopation. *Suspension* relates to rhythm-harmony ; *syncopation* relates to measure, and therefore to meter. Hence under the head of rhythm-harmonic analysis, the above illustrations must be named Suspensions ; under the head of metrical

analysis, they must be named syncopations; they are therefore both, and all a student requires is to know the meaning of the two.

At N.B. in the following example the resolution-tone of one Suspension is at once converted into a new Suspension. **Ex. 224.**

N.B. N.B. N.B. N.B. N.B.



In the next example, the Soprano is in constant Suspension up to the point where the dotted line stops: this is due to the fact that at the exact point where one Suspension should be resolved a new Suspension is initiated by a change of harmony. **Ex. 225.**



Although the illustrations thus far given do not present our subject in all of its phases, they are sufficiently comprehensive to demonstrate that all Suspensions are definable in the same terms, namely, a Suspension is a *delay of resolution*.

The practical treatment of Suspensions by this System may be inferred by music educators from the preceding explanations. As the student of this System begins with scale-halves and the Principle of Progression, it is obvious that he can have no difficulty in appreciating what a delay of resolution, or progression, means. Again, it must be plain to my reader at this juncture that my pupil can treat Suspensions in *one* voice with a perfect appreciation of their true nature. Hence it follows that the subject of Suspension may now be introduced at an early stage in music education and long before two, three, or four voices are treated, while at present current systems place this subject after Harmony and require four-voiced harmony to demonstrate it.

The following Suspensions in scale-halves can be understood by every musical child : **Ex. 226.**



The student of this System being compelled to do his work mentally gains a concrete experience of the fact that the mental effort by which an harmonic is converted into a bytone is an accent and corresponds to a *rhythmical accent*. Again, my pupil discriminates such common Suspensions before the *third* as those presented below with the same automatism with which he recognizes anything that is perfectly familiar to him ; moreover, he hears the *keyklangs*, he hears the downleaders and upleaders, and he knows in which scale-half and stratum each Suspension occurs. **Ex. 227.**



Supplementary Remarks on the Tone-Stratum.

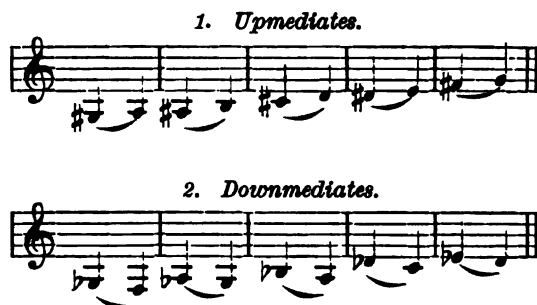
There may be those among my readers that will inquire why in the central tone-stratum of *C* there is no *G♭*, no *D♭*, no *A×*, and no *D×*. Such a criticism would be perfectly natural, for, if there are such tones as those just named, and there are, why are they not included in this central stratum ? Again, how can the central stratum be complete in twenty-seven tones, as has been asserted, when there are tones which have not been incorporated in it ? All this may be easily explained.

This System is based on *key-relations* and *key-harmony*, and its tones have been described as belonging to one of three groups, as follows :

- | | |
|--|-----------|
| 1st Group: Principals..... | 7 tones. |
| 2d Group: Primary Intermediates..... | 10 tones. |
| 3d Group: Secondary Intermediates..... | 10 tones. |
| In all..... | 27 tones. |

Primary intermediates are resolved into *principals*; *secondary intermediates* are resolved into *primary intermediates*. Hence in this their primal relation, secondary intermediates stand in the same relation to primary intermediates as do primary intermediates to principals.

The natural resolution of primary intermediates into principals is as follows: **Ex. 228.**

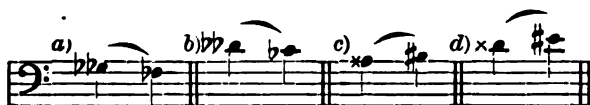


The natural resolution of secondary intermediates into primary intermediates is presented below: **Ex. 229.**



The reader will remark that the incidents in **Ex. 228** belong to the *Second Relationship*, while those in **Ex. 229** belong to the *Third Relationship*.

Now in the key of *C*, no *G*♭, no *D*♭, no *A*×, and no *D*× can arise in the *Third Relationship*, for the obvious reason that *these tones are not resolvable into the tones of the Second Relationship*. These four tones are resolved as follows: **Ex. 230.**



In this example it is seen that the four tones in question are resolved into the tones of the *Third Relationship* of the key of *C*:

in other words, they are resolved into *secondary* intermediates. Hence, were we to relation these tones in the key of *C*, they would have to be classed under the head of the *Fourth* Relationship, and there is no such Relationship. Therefore it follows that these tones do not belong to the central stratum of *C* but belong to the strata of other keys, in which they arise in the *Third* Relationship.

The four tones $D \times$, $A \times$, $D \flat$, and $G \flat$ first arise in the keys of *G*, *D*, *F*, and *B \flat*, as follows:

$D \times$ first arises in the Third Relationship in the key of *G* as $\bar{4} \times$.

$A \times$ first arises in the Third Relationship in the key of *D* as $\bar{4} \times$.

$D \flat$ first arises in the Third Relationship in the key of *F* as $\bar{3} \flat$.

$G \flat$ first arises in the Third Relationship in the key of *B \flat* as $\bar{3} \flat$.

Hence these four tones are *secondary* intermediates in their respective keys, and are resolved into the primary intermediates of their respective keys, as follows: **Ex. 231.**



The key being at the foundation of all music and one key being constituted like another, the three Relationships present all the relations in which tones can possibly be conceived, and the full tone-stratum of each key is limited to twenty-seven tones. Hence the tonal relations in the above example introduce nothing new, inasmuch as they only present in other keys what has already been described in the central key of *C*.

Centralization of Keys.

Hitherto we have dealt with the constitution of the key as a unit and have considered the relations of keyklangs among themselves in *one* key. The point has now been reached where it becomes necessary to investigate the relations of keys and therefore the relations of the keyklangs of one key with those of other keys. In order to present the subject of Modulation with greater clearness, it may be preluded by a more careful presentation of

the centralization and inter-relations of keys than was given in Chapter III., where the subject was provisionally discussed.

As through the process of Modulation the relations of keyklangs are changed from one key to another, it is evident that the relative positions of all key-centers is an important preconsideration.

The individual tone middle *C* being the focal point and starting-point of this System, and the key of *C* being the central key of this System, it follows that this key is the first and main key, and that all other keys must stand in some close or removed relation to this key.

As the central stratum of the key of *C* presents in its twenty-seven tones all the tones that can be practically employed as key-centers, and for the reason that in this System all these tones *first* arise in the central stratum of *C*, it is obvious that each of the tones in this central stratum must in its turn be the starting-point, or key-center, of another key. Other grounds on which my conception of a centralized System of keys is based need not be reiterated here.

The twenty-seven tones of the central stratum represent just so many *central Tonics* of just so many central *Septonates* and key-groups of just so many keys.

According to the three Relationships of tones in the key of *C*, I classify keys in three corresponding groups, which is in consistent accord with all my previous classifications. In this way the relations of all keys to the first and main key are clearly pointed out.

The three groups of keys are specified as follows :

1. The *First Group* comprises all keys whose *Tonics* are *principals*. There are seven such keys.
2. The *Second Group* comprises all keys whose *Tonics* are *primary intermediates*. There are ten such keys.
3. The *Third Group* comprises all keys whose *Tonics* are *secondary intermediates*. There are ten such keys.

How the relative positions of all keys are described by this System was explained in Chapter III.

The *Septonates* of all keys may now be presented in their respective groups. As the key-centers of all keys lie in the central stratum, it follows that *the majority of the tones which make up the central Septonates of all keys lie in the central stratum*. This is shown plainly in the following presentation of the central *Septonates* of the *First Group of Keys*, in which the limits of the central stratum are marked off for the purpose of facilitating observation.

Ex. 232.

Central Stratum.

Key of C.

Key of G.

Key of F.

Key of A.

Key of E.

Key of B.

Key of D.

KEY-TRIUNITY OF C.

The central Septonates of the *Second Group of Keys* are presented in two divisions :

1. *The five upmediate keys.*
2. *The five downmediate keys.*

The central Septonates of the five upmediate keys are as follows : **Ex. 233.**

Central Stratum.

KEY-TRIUNITY OF C \sharp

Key of C \sharp

Key of G \sharp

Key of F \sharp

Key of A \sharp

Key of D \sharp

Fingerings: 4 3 2 1 2 3 4

Next follow the central Septonates of the five downmediate keys: **Ex. 234.**

Central Stratum.

Key of G \flat .

Key of A \flat .

Key of B \flat .

Key of D \flat .

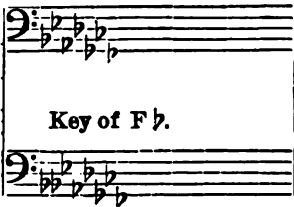
Key of E \flat .

Fingerings: 4 3 2 1 2 3 4

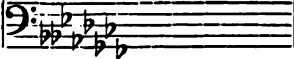
Of the ten keys of the *Third Group*, the central Septonates of only two are given: the remaining eight keys of this group are omitted here for the obvious reason that their notation is too complex to render them practical in musical writing. **Ex. 235.**


Central Stratum.

Key of C \flat .



Key of F \flat .





A brief survey of this presentation of all key-centers and their central Septonates not only affords a clear view of the relative positions of all keys, but also suggests the intimate relations that must exist between all keys, for the reason that although all the above Septonates are represented and marked as belonging to so many distinct keys, they nevertheless present no tones which do not appear in the central tone-stratum of *C*, and therefore *all the above Septonates and scale-halves may be conceived and described as belonging to one of the three Relationships in the key of C*. How all the above scale-halves and Septonates are to be conceived and described in practical music obviously depends on the key in which they occur and on Modulation.

It follows as a matter of course that every key-center, like the key-center of *C*, is the center of its own Septonate, keygroup, and full stratum; and, one key being constituted exactly like another, it is obvious that twenty-seven tones may be related from every key-center, that the tones of every key combine in three Relationships, and therefore, that all keys are individually subject to the same analyses and classifications.

Inter-relations of Keys.

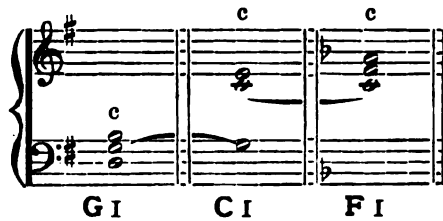
By *inter-relations* of keys we understand *harmonic* relations of keys. In other words, the various degrees of intimacy between keys can alone be established through harmonic analysis.

The center and two poles of a Septonate are the fixed and primary klangs of a key; these three primary keyklangs are the initial and terminal tones of two scale-halves, and they are the chord-

centers of the three primary chords of a key ; these three primary chords are composed of the seven principals, they constitute the basal harmony of the seven principals, and therefore represent the basal harmony of a key ; these three primary chords represent the closest harmonic relations that exist in music, they are exactly alike in constitution, they represent the major-mode of a key, and, according to this System, they constitute the harmonic basis of the First Relationship. Hence it is plain that keys are nearest related by common primary keyklangs, and therefore by common primary chords.

This closest kinship of keys is represented by what has already been named a key-triunity.

A key-triunity contains a central key, an under key, and an over key. Every key-center is the center of a key-triunity. The central Tonic-chords of the *C*-triunity are presented below : **Ex. 236.**



In the key of *C*, these three chords are described :

u IV—I—o IV, *First Relationship.*

In the key of *G*, they are described :

I—o IV, *First Relationship.*

u II♯, *Second Relationship.*

In the key of *F*, they are described :

o II, *Second Relationship.*

u IV—I, *First Relationship.*

Thus in a key-triunity we observe that *two of the primary chords of the central key* are primary chords in *each of the other two keys*. The following chord-centers of the *C*-triunity plainly point out the primary chords which are common to the three keys : **Ex. 237.**

The diagram consists of three staves, each representing a different key relative to a central key (C). The top staff is labeled 'Over key.' and shows the chords uIV, I, and oIV. The middle staff is labeled 'Central key.' and also shows the chords uIV, I, and oIV. The bottom staff is labeled 'Under key.' and shows the chords uIV, I, and oIV. Arrows indicate the relationships between the chords: uIV to I, I to oIV, and oIV to uIV. The diagram illustrates the relationships between the Over key, Central key, and Under key, showing how the chords in one key relate to the chords in the other keys.

Here the student of this System readily observes that the chords $uIV-I$ in C are $I-oIV$ in G ; that the chords $I-oIV$ in C are $uIV-I$ in F . Or, to state the case in another way, the student observes that the Tonic-chord in C is the over-Dominant chord in G and the under-Dominant chord in F ; that the under-Dominant chord in C is the Tonic-chord in G , and that the over-Dominant chord in C is the Tonic-chord in F .

The three Relationships of this System obviously render the observation of the inter-relations of keys very simple, as follows:

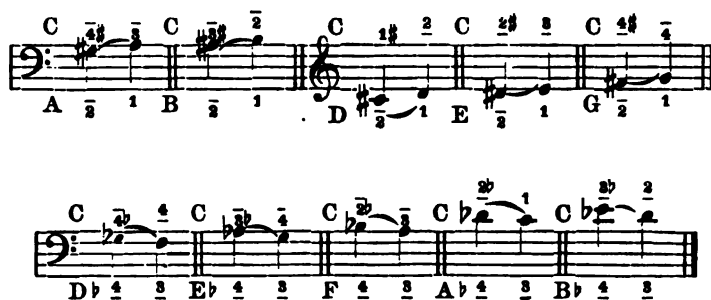
Those keys are nearest related whose First Relationships contain the largest number of common tones.

As the First Relationship in every key is represented in the *principals* of every key, the above general law may be put still more concisely, namely: *those keys that have the most principals in common are nearest related.*

This is the case with the three keys that make up a key-triunity. In the C -triunity the under and over keys G and F each contain six of the principals of C among their principals. In place of the *downleader* F in C , the G -Septonate introduces the *upleader* $F\sharp$: in place of the *upleader* B in C , the F -Septonate introduces the *downleader* $B\flat$.

In the key of C itself, $F\sharp$ is an *upmediate*, and $B\flat$ is a *downmediate*. Attention has already been called to the similarity of upmediates and upleaders, and of downmediates and downleaders. At this juncture the practical value of this observation to the student becomes manifest: for here the student learns that the conversion of any upmediate into an upleader changes the relation of a keyklang to $\bar{3}$, while the conversion of any downmediate into a downleader changes the relation of a keyklang to $\bar{4}$. In the following example the upmediates and downmediates in C are thus

converted into upleaders and downleaders of other keys, as indicated by letters and keyklang numbers under the staff: **Ex. 238.**



The facts that every upmediate of one key is convertible into an upleader of another key and that the downmediates of one key are convertible into downleaders of other keys, suggest to what great degree this System simplifies the problems and study of Modulation.

Every tone and therefore every chord in this System plays a part in every key.

Hence: *every tone and every chord in the System occurs in one of the three Relationships of every key.*

Hereupon it follows that *every tone in the System appears in every key as the chord-center of every possible variety of consonant and dissonant chords*, and each such chord is described as belonging to one of the three Relationships.

Just as the scale-halves and Septonates of all keys occur in one of the three Relationships of the key of C, so also do they appear in one of the three Relationships of every key.

Thus *the three Relationships unite all keys into a perfect whole, or system*, and the consequence is that *all keys are inter-related*, be they so-called sharp keys or so-called flat keys.

Hence it follows that at any moment *we may, in thought, convert any keyklang of any key into another keyklang of any other key and thus modulate from any one key to any other.*

Every key has two modes:

1. The *major mode*, which is the natural Septonal mode and which has also been named the bright mode. This mode occurs in the First Relationship.

2. The *minor mode*, which has already been named the dark mode. This mode occurs in the Second Relationship.

The major mode is represented by its three primary chords, which are *major* chords.

The minor mode is represented by its three primary chords, which are *minor* chords.

The two modes of the keys that constitute the central key-triunity of *C* are given below : **Ex. 239.**

Example 239 displays the primary chords for the Major and Minor modes of the keys of C major and C minor. The notation is organized into two columns: 'Major : 1st Rel.' and 'Minor : 2d Rel.'.

Major : 1st Rel. (C major): The first column shows the chords uIV (F major), I (C major), and oIV (F# major) in three staves (bass, tenor, and soprano clefs). The second column shows the chords uIV (F major), I (C major), and oIV (F# major) in the same three staves.

Minor : 2d Rel. (C minor): The first column shows the chords uIV (F major), I (C major), and oIV (F# major) in three staves (bass, tenor, and soprano clefs). The second column shows the chords uIV (F major), I (C major), and oIV (F# major) in the same three staves.

Since every tonal incident is a key-incident, since every tone occurs in some relation in every key, therefore since every tone may be conceived as a key-center, and since a key-center is the individual Tonic of two modes : it follows that modulations are easily made from either mode of any one key to either mode of any other key.

The intimate relation between keys whose centers lie a small, or minor, third apart is due to the fact that the minor mode of one such key is composed exclusively of tones that are *principals* in the other key. Thus the minor mode of *C* is composed of tones that are principals in the key of *E♭* : the minor mode of *A* is composed of tones that are principals in the key of *C* : and so on with all similarly related keys. These two cases will serve to illustrate this relation as follows : **Ex. 240.**

Example 240 illustrates the relation between the minor mode of one key and the major mode of another key. The notation is organized into two columns: 'C minor.' and 'A minor.'.

C minor. / E♭ major.: The first column shows the C minor scale in the bass clef and the E♭ major scale in the treble clef. The second column shows the C minor scale in the bass clef and the E♭ major scale in the treble clef.

A minor. / C major.: The first column shows the A minor scale in the bass clef and the C major scale in the treble clef. The second column shows the A minor scale in the bass clef and the C major scale in the treble clef.

The reader is reminded here of the explanation in Chapter III.

of the fact that no such thing as a *MINOR key* exists: hence, by *C* minor is meant the *minor mode* of *C*, by *E* \flat major, the *major mode* of *E* \flat , etc.

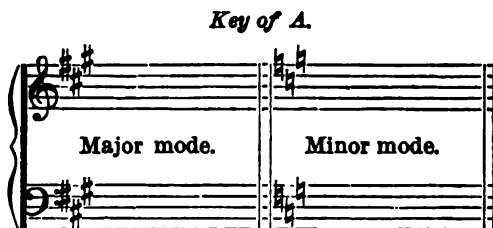
The change from *C* major to *C* minor, and *vice versa*, is not a change of key, simply because in a change of key the relations of tones are shifted from one key-center to another. As *C* major and *C* minor have a common key-center, a change from one to the other is simply a change of mode. Were such a thing as a *minor key* conceivable, changes from major to minor would have to be regarded as changes of key: indeed, were there such a unit as a *minor key*, all those hundreds of Preludes, Fugues, Sonata and Symphony movements, and other compositions, that are written in the Tonic minor and are terminated in the Tonic major, and *vice versa*, would indicate that the composer began in one key and ended in another, which is absurd.

On the other hand, a change from *C* major to *A* minor, and *vice versa*, is a positive change of key, for in this case the relations of tones are changed from one key-center to another. Although *C* major and *A* minor are represented by the same tones, it must not be forgotten that in the former case these tones occur in relation with the key-center *C* and are *principals*, while in the latter case these tones occur in relation with the key-center *A* and are a mixture of principals and *primary intermediates*. It must also be taken into consideration, and this is of immediate concern to modulation, that in the two keys the same tones are different keyklangs with different keyklang numbers; and that the very tones, namely *C*, *G*, and *F*, which are the three *primary keyklangs* in the key of *C* are *downmediates* in the key of *A*. See **Ex. 241**.

Measure	in C (Top Staff)	in A (Bottom Staff)
1	C (uIV)	A (uII), F (uIII)
2	G (I)	C (oIII), E (uIII)
3	E (oIV)	G (uIII), A (uII)

This example reviews the subjects of notation and key-signatures. That each mode of a key should have its distinguishing signature is a matter of course. That every minor mode should borrow the signature of *another key and mode* is manifestly illogical. Why this has been done we all know. Still the fact that a certain

rule has been generally accepted by theorists is, at least in music, which has no science as yet, no guarantee that the rule is valid. It is only reasonable that the signature for the minor mode should plainly indicate the key to which the mode belongs. Thus *A* minor should have a signature that would directly indicate its relation to the key of *A* where it arises. While it is difficult to decide what would be the simplest plan by which this can be consistently carried out in all keys, there is no difficulty in devising plans. For example: the following presentation of the two modes of the key of *A* tells its story far more clearly than the common method, for the reason that the minor signature at once indicates the *downmediates* which belong to the mode, and in these *downmediates* the student readily observes the relation of *A* minor to *C* major, as described above. **Ex. 242.**



The inter-relations of keys may be illustrated by presenting and describing the consonant chords of a single chord-center in all keys.

For this purpose I will take the chord-center *C*: the left-hand column describes the major chord of *C* in all keys; the right-hand column describes the minor chord of *C* in all keys: the Roman numerals and Relationship numbers speak for themselves. **Ex. 243.**

Major Chord of C.

I,	Key of C,	First Rel.
oIV,	Key of G,	First Rel.
uIV,	Key of F,	First Rel.
oIII \sharp ,	Key of A,	Second Rel.
uIII \sharp ,	Key of E,	Second Rel.
oII \sharp ,	Key of B,	Second Rel.
uII \sharp ,	Key of D,	Second Rel.
oIV \sharp ,	Key of G \sharp ,	Third Rel.
oIII \sharp ,	Key of A \sharp ,	Third Rel.
I \sharp ,	Key of C \sharp ,	Third Rel.
uII \sharp ,	Key of D \sharp ,	Third Rel.
uIV \sharp ,	Key of F \sharp ,	Second Rel.

Minor Chord of C.

I,	Key of C,	Second Rel.
oIV,	Key of G,	Second Rel.
uIV,	Key of F,	Second Rel.
oIII \sharp ,	Key of A,	Second Rel.
uIII \sharp ,	Key of E,	Third Rel.
oII \sharp ,	Key of B,	Third Rel.
uII \sharp ,	Key of D,	Second Rel.
oIV \sharp ,	Key of G \sharp ,	Third Rel.
oIII \sharp ,	Key of A \sharp ,	Third Rel.
I \sharp ,	Key of C \sharp ,	Third Rel.
uII \sharp ,	Key of D \sharp ,	Third Rel.
uIV \sharp ,	Key of F \sharp ,	Third Rel.

Major Chord of C.

{	oIV ♯, Key of G ♯, Second Rel.
	oIII, Key of A ♯, Second Rel.
	oII, Key of B ♯, Second Rel.
	uII, Key of D ♯, Second Rel.
	uIII, Key of E ♯, Second Rel.
{	I ♯, Key of C ♯, Third Rel.
	uIV ♯, Key of F ♯, Third Rel.

Minor Chord of C.

{	oiv ♯, Key of G ♯, Second Rel.
	oiii, Key of A ♯, First Rel.
	oii, Key of B ♯, First Rel.
	uii, Key of D ♯, Second Rel.
	uiii, Key of E ♯, First Rel.
{	i ♯, Key of C ♯, Second Rel.
	uiv ♯, Key of F ♯, Second Rel.

The brackets in this example mark off the three groups of keys in the order which was given a few pages back.

As the consonant and dissonant chords of every chord-center appear in one of the three Relationships of every key and may be accurately described like the one in the above example, it not only follows that keys are closely inter-related, it follows also that modulations from any one key to any other are easily effected.

A Provisional Simplification of Notation.

At this stage of my subject a few points regarding a simplified and a more consistent notation may be introduced without any danger of creating confusion.

Some of the shortcomings of our present *sharp* and *flat* system of notation have been criticised by me in various parts of this writing, and my conception of a plan by which each tone in the System shall be known by a separate letter has already been announced in Chapter I. That such an innovation is both logical and necessary was explained on the ground that tones are individual and immutable, or in other words, that tones are distinct from one another and cannot be modified.

Since this innovation involves a complete change in the nomenclature of tones and therefore of notes, and since it further entails the complete elimination of sharps, flats, and naturals, it is not likely that the resulting new notation would or could be received with any favor for a long time to come, however much it might simplify matters. It will be obvious to every reader why I have not presented my System of tones in the garb of a new notation, for, had this been done, the reader would have been called upon to habituate himself to a new notation in order to be able to read my illustrations, and this would have been folly on the part of an author who desires to present new ideas as intelligibly as he can.

More than this, the new notation would have caused unnecessary and almost insurmountable difficulties in the department of typography.

There is, however, one department in my new notation which may be applied to the sharp and flat system without creating any confusion and with efficient practical results. I refer to the keyklang and chord-center numbers and the symbols that accompany them. According to my new device, *these numbers and symbols consistently correspond in all keys* : not only are all principals in all keys marked alike, but so are all *intermediates* in all keys. I feel that no musician will overlook the simplification that such logical consistency must lead to.

Upon incorporating the intermediates into the key, it followed as a natural consequent that keyklang and chord-center numbers had to appear in conjunction with sharps, flats, and naturals, in order to make plain the pitch of the tone and the name of the note referred to. The sharps and flats work very well in the central key of *C*, for in this key there is a logical connection between a *sharp* and an *upmediate*, and between a *flat* and a *downmediate*. Briefly, in the key of *C* there is some sense and meaning attachable to and appreciable in sharps and flats; but just as soon as we leave this key for another, these sharps and flats cease to have any sense whatever and are most confusing. This great chaos, which is directly ascribable to the sharp and flat system itself, is strikingly and plainly exposed by the keyklang System. A few illustrations will show this : as keyklang and chord-center numbers are the same, we will employ the keyklang numbers for our illustrations.

The *upmediates* in other keys which correspond to $1\sharp$ and $4\sharp$ in the key of *C* are given below in several keys : **Ex. 244.**

- a) $\left\{ \begin{array}{l} 1\sharp, \text{ Key of } C. \\ 1\sharp, \text{ Keys of } C\sharp, G\sharp, F\sharp \text{ etc.} \\ 1\flat, \text{ Keys of } B\flat, E\flat, A\flat, D\flat, \text{ etc.} \end{array} \right.$
- b) $\left\{ \begin{array}{l} 4\sharp, \text{ Key of } C. \\ 4\sharp, \text{ Keys of } C\sharp, G\sharp, D\sharp \text{ etc.} \\ 4\flat, \text{ Keys of } F, B\flat, E\flat, A\flat, \text{ etc.} \\ 4\flat, \text{ Key of } F\flat. \end{array} \right.$

Again, the *downmediates* in the other keys which correspond to $2\flat$ and $3\flat$ in the key of *C* may also be presented in a few keys, as follows : **Ex. 245.**

$$a) \left\{ \begin{array}{l} \bar{a}^b, \text{ Key of } C. \\ \bar{a}^b, \text{ Keys of } G, D, A, E, \text{ etc.} \\ \bar{a}^b, \text{ Keys of } G^\sharp, D^\sharp, \text{ etc.} \\ \bar{a}^b, \text{ Keys of } C^b \text{ and } F^b. \end{array} \right.$$

$$b) \left\{ \begin{array}{l} \bar{a}^b, \text{ Key of } C. \\ \bar{a}^b, \text{ Keys of } D, A, E, B, \text{ etc.} \\ \bar{a}^b, \text{ Keys of } C^b, G^b, F^b. \\ \bar{a}^b, \text{ Keys of } A^\sharp \text{ and } D^\sharp. \end{array} \right.$$

A glance at the last two examples will reveal the supreme chaos that is wrought by sharps, flats, and naturals.

Here we observe that *upmediates* appear not only as \sharp and \times , they appear also as \natural and \flat : while the former might pass as logical, the latter present just so much nonsense.

Here again are some *downmediates* that appear as \flat and $\flat\flat$, while others appear as \natural and \sharp . Again, while downmediates can be logically associated with flats and double-flats, they are decidedly misrepresented by naturals and sharps.

These illustrations of the first group of intermediates so plainly demonstrate the confusion, the inconsistency, and the complications to which these sharps, flats, and naturals give rise, that I do not deem it necessary to present illustrations of the second group of intermediates, where this confusion, this inconsistency, and these complications are still greater. It must be obvious to every reader that absolutely no sense attaches to these signs outside of the key of *C*.

How sharps and flats are to be eliminated from notation, what symbols are to be substituted for them, and what my general scheme for a new notation is, are matters which I have preferred to reserve for a separate publication.

Since the sharp and flat system is the one to which we are compelled to adhere at present and probably for a long time hence, the point has been reached where the above intricate and unnecessarily complex symbols that accompany keyklang and chord-center numbers, which do not correspond in *any two* keys, may be substituted by other symbols which correspond in *all* keys.

As the System of tones now stands, the keyklang and chord-center numbers that represent *principals* correspond in all keys, as follows: **Ex. 246.**

Principals.

Keyklang numbers :	$\bar{4}$,	$\bar{3}$,	$\bar{2}$,	1,	$\bar{2}$,	$\bar{3}$,	$\bar{4}$
Chord-center numbers :	u IV,	u III,	u II,	I,	o II,	o III,	o IV.

As the point at issue relates solely to symbols and not to harmony, the above chord-center numbers and those that follow are printed in large type, merely for the sake of uniformity of presentation.

The symbols that I employ in my new system of notation for *upmediates* are *'* and *''*. These symbols have a double signification, as follows:

1. These symbols directly convey the idea of the direction of progression as *up*, and they therefore plainly and directly describe the exact character of a tone as an *upmediate*.

2. The single mark *'* indicates *one degree*, or half step, *higher* than the number which it accompanies. Thus: $\frac{1}{4}'$ indicates the upmediate that lies one-half step higher than $\frac{1}{4}$; $\frac{1}{4}'$ indicates one-half step higher than $\frac{1}{4}$; $\frac{1}{4}'$ indicates one-half step higher than $\frac{1}{4}$; and so on. As this symbol indicates *one-degree upmediate*, I name it the *one-degree upmediate* sign.

The double mark *''* indicates *two degrees*, or half steps, higher than the number which it accompanies. Thus: $\frac{1}{4}''$ indicates *two* half steps higher than $\frac{1}{4}$; $\frac{1}{4}''$ indicates *two* half steps higher than $\frac{1}{4}$; and so on. As this symbol indicates *two-degree upmediates*, I name it the *two-degree upmediate* sign.

The *primary* upmediates in all keys are *one-degree* upmediates, and the keyklang and chord-center symbols for these *one-degree* upmediates *correspond in all keys*, as follows: **Ex. 247.**

*Primary Upmediates.**

$$\left\{ \begin{array}{ccccc} \frac{1}{4}' & \frac{1}{8}' & \frac{1}{2}' & \frac{3}{4}' & \frac{1}{1}' \\ uIV & uIII & I & oII & oIV \end{array} \right.$$

The secondary upmediates in all keys are composed of *three two-degree* upmediates and *two one-degree* upmediates: the keyklang and chord-center symbols for these secondary upmediates are the same in all keys as follows: **Ex. 248.**

* These symbols are read as follows:

$\frac{1}{4}'$ is read: *under four, one degree up.*

$\frac{1}{4}''$ is read: *under four, two degrees up; and so on.*

Secondary Upmediates.

$$\left\{ \begin{array}{ccccc} \frac{\text{u}}{4} & \frac{\text{u}}{3} & \frac{\text{u}}{2} & \frac{\text{u}}{1} & \frac{\text{u}}{0} \\ \text{uIV} & \text{uII} & \text{I} & \text{oIII} & \text{oIV} \end{array} \right.$$

The symbols which I have devised for downmediates are v and vv . Like the upmediate symbols, these also have a double signification :

1. These marks at once convey the idea of *down-progression*, and therefore of *downmediate*.

2. The single mark v indicates *one* degree, or half step, *lower* than the number which it accompanies. Thus: $\text{v}1$ indicates one-half step lower than 1; $\text{v}2$ indicates one-half step lower than 2; $\text{v}3$ indicates one-half step lower than 3; and so on. I name this symbol the *one-degree* downmediate sign.

The double mark vv signifies *two* degrees, or half steps, *lower* than the number which it accompanies. Thus: $\text{vv}2$ denotes *two* half steps lower than 2; $\text{vv}3$ denotes *two* half steps lower than 3; and so on. I name this symbol the *two-degree* downmediate sign.

The *primary* downmediates in all keys are *one-degree* downmediates: the keyklang and chord-center symbols for these primary downmediates are uniformly the same in all keys, as follows: **Ex. 249.**

*Primary Downmediates.**

$$\left\{ \begin{array}{ccccc} \text{v}4 & \text{v}3 & \text{v}2 & \text{v}1 & \text{v}0 \\ \text{uIV} & \text{uIII} & \text{uII} & \text{oII} & \text{oIII} \end{array} \right.$$

The *secondary* downmediates in all keys are composed of *three two-degree* downmediates and *two one-degree* downmediates: the keyklang and chord-center symbols for these secondary downmediates are the same for all keys, as follows: **Ex. 250.**

Secondary Downmediates.

$$\left\{ \begin{array}{ccccc} \text{vv}3 & \text{vv}2 & \text{v}1 & \text{vv}0 & \text{v}0 \\ \text{uIII} & \text{uII} & \text{I} & \text{oIII} & \text{oIV} \end{array} \right.$$

* These symbols are read as follows:

$\text{v}3$ is read: *over three, one degree down.*

$\text{vv}3$ is read: *over three, two degrees down; and so on.*

The accompanying chart is headed by the new keyklang and chord-center symbols, and presents in its three vertical divisions the *three groups of tones*, as classified by me, in nineteen keys. This chart plainly illustrates the fact that the new symbols are the same for all keys, and as logically and consistently indicates one-degree and two-degree upmediates and downmediates in one key as in another.

By following any of the lines from left to right across the chart, we read the twenty-seven tones that constitute any one key.

By reading each column up and down, we read the corresponding tones of the corresponding groups of all the nineteen keys.

The heavy single vertical lines which subdivide the second and third divisions of the chart mark off the upmediates and downmediates of both divisions.

Each key, as well as the group to which it belongs, is indicated at the left of the chart: the double horizontal lines in the chart and the brackets on the left mark off the three groups of keys, as classified in this System.

My first purpose in presenting this chart is accomplished, inasmuch as the chart fully proves that the new keyklang and chord-center symbols are logically and consistently the same for the corresponding tones of all keys.

There are, however, other points, too important to be passed over here, that are strikingly exposed to view in the chart. I refer to the supreme chaos and inconsistency of sharp and flat nomenclature and notation, and the consequent urgent necessity for a simple and rational system of nomenclature and notation. It does not seem possible that the most prejudiced and non-progressive musician can escape the observation and admission of these points.

A glance at the second and third divisions of the chart discloses the significant fact that *in no key is there such a thing as a THREE-degree upmediate and a THREE-degree downmediate*. While this fact is shown plainly in the keyklang and chord-center symbols, it is directly refuted by the sharps and flats that accompany the columns of letters. For example: the chart presents *triple* sharps and *triple* flats, which, according to common usage, mean *triple modifications* of a tone. Thus $c \times \sharp$ plainly indicates a *triple* modification, and therefore a *three-degree* upmediate; $e \flat \flat \flat$ indicates a *triple* modification, and therefore a *three-degree* downmediate: yet they are neither *triple* modifications nor *three-degree* upmediates and downmediates. The former is marked ♯ in the key of $C \sharp$, and

KEYKLANG AND CHORD-CENTER SYMBOLS.

		Secondary Intermediates.									
		Upmediates.					Downmediates.				
Symbols for Keyklangs.		$\frac{1}{2}$	$\frac{1}{1}$	$\frac{3}{2}$	$\frac{4}{1}$		$\frac{2}{3}$	$\frac{2}{2}$	$\frac{1}{1}$	$\frac{2}{3}$	$\frac{1}{4}$
Symbols for Chord-centers.		$\frac{1}{1}$	$\frac{1}{1}$	$o\frac{1}{1}I$	$o\frac{1}{1}V$		$u\frac{1}{1}I$	$u\frac{1}{1}I$	$\frac{1}{1}$	$o\frac{1}{1}I$	$o\frac{1}{1}V$
First Group of Keys.	Key of C	c \times	e \sharp	f \times			a \flat	b \flat	c \flat	e \flat	f \flat
	Key of G	g \times	b \sharp	c \times			e \flat	f \flat	g \flat	b \flat	c \flat
	Key of F	f \times	a \sharp	b \flat			d \flat	e \flat	f \flat	a \flat	b \flat
	Key of A	a \times	c \times	d \times			f \flat	g \flat	a \flat	c \flat	d \flat
	Key of E	e \times	g \times	a \times			c \flat	d \flat	e \flat	g \flat	a \flat
	Key of B	b \times	d \times	e \times			g \flat	a \flat	b \flat	d \flat	e \flat
	Key of D	d \times	f \times	g \times			b \flat	c \flat	d \flat	f \flat	g \flat
Second Group of Keys.	Key of G \sharp	g $\times\sharp$	b \times	c $\times\sharp$			e \flat	f \sharp	g \sharp	b \flat	c \sharp
	Key of A \sharp	a $\times\sharp$	c $\times\sharp$	d $\times\sharp$			f \sharp	g \sharp	a \sharp	c \sharp	d \sharp
	Key of C \sharp	c $\times\sharp$	e \times	f $\times\sharp$			a \flat	b \flat	c \sharp	e \flat	f \sharp
	Key of D \sharp	d $\times\sharp$	f $\times\sharp$	g $\times\sharp$			b \flat	c \sharp	d \sharp	f \sharp	g \sharp
	Key of F \sharp	f $\times\sharp$	a \times	b \times			d \flat	e \flat	f \sharp	a \flat	b \flat
	Key of G \flat	g \sharp	b \sharp	c \sharp			e \flat	f \flat	g \flat	b \flat	c \flat
	Key of A \flat	a \sharp	c \sharp	d \sharp			f \flat	g \flat	a \flat	c \flat	d \flat
	Key of B \flat	b \sharp	d \sharp	e \sharp			g \flat	a \flat	b \flat	d \flat	e \flat
	Key of D \flat	d \sharp	f \sharp	g \sharp			b \flat	c \flat	d \flat	f \flat	g \flat
	Key of E \flat	e \sharp	g \sharp	a \sharp			c \flat	d \flat	e \flat	g \flat	a \flat
Third Group of Keys.	Key of C \sharp	c \sharp	e \sharp	f \sharp			a \flat	b \flat	c \flat	e \flat	f \flat
	Key of F \sharp	f \sharp	a \sharp	b \sharp			d \flat	e \flat	f \flat	a \flat	b \flat

is a *two-degree upmediate*; the latter is marked $\frac{3}{2}$ in the key of $C\flat$, and is a *two-degree downmediate*. Just so, $c\times$ indicates a double modification and a *two-degree upmediate*: yet in the key of $C\sharp$ this tone is a *one-degree upmediate* and is marked \sharp . These contradictions and vexatious inconsistencies appear on every line of the chart. To be sure, we know that if $c\sharp$ is our principal, $c\times$ must be the *one-degree upmediate*, and $c\times\sharp$ must be the *two-degree upmediate*, and that the same is necessarily true of all so-called modifications when the principal is a modified tone. However, this does not in any way relieve the sharp and flat system of the charges here brought against it: on the contrary, the incongruities of the sharp and flat system are thereby rendered still more obvious and intricate.

The chart does not present all keys. For reasons already given, eight keys are omitted in the Third Group. The key-centers of these eight keys are $G\times$, $B\sharp$, $C\times$, $E\sharp$, $F\times$, $A\flat\flat$, $B\flat\flat$, and $E\flat\flat$. So long as there are such keys, it is no more than reasonable that a perfect system of notation should enable us to write in one key as easily as in another. It goes without saying that their sharps and flats render notation and note-nomenclature in these keys too complex for practical use. In the keys of $G\times$, $C\times$, and $F\times$, the secondary upmediate \sharp is $g\times$, $c\times$, and $f\times$, in the three keys respectively. This quadruple sharp at once suggests a *four-degree upmediate*: yet the symbol \sharp plainly shows these quadruple sharps to be *two-degree upmediates*. Upon such premises, the natural conclusion is that, so long as there are no *three-degree* and *four-degree upmediates* and *downmediates*, there is no sense in such contradictory sharp and flat symbols or in the note-nomenclature to which they give rise. The three Relationships of this System conclusively prove that there are only principals, and primary and secondary intermediates: the three Relationships in their one-degree and two-degree upmediates and downmediates conclusively prove that, to use the phraseology of current systems, the modification of a tone cannot exceed *two degrees*.

Complicated, contradictory, senseless, and brain-racking as it is to think out the sharps and flats in the three Relationships of all keys, there is nevertheless no alternative for the student but to set to work and learn the contents of the chart. For the student that does not know the sharps and flats of the three Relationships in all keys lacks just so much essential rudimentary knowledge.

Through a gradual recognition of the exact harmonic inter-relations of tones, therefore through harmony, our modern tone-structure was perfected. It has been demonstrated in these pages that the key and key-harmony are at the foundation of this perfect structure.

The Tonal System was perfected harmonically when it was developed into a *system of keys*. This was accomplished by Temperament.

Thus key-harmony and Temperament stand in the relation of cause and effect.

The degree of the temperament of a tone must be such as to render each tone in the System harmonious in all its harmonic relations in one key and in all keys. Key-harmony, or the harmony that arises when we relation keyklangs, furnishes the exact degree of such temperament.

Temperament is often referred to as a *necessary evil*. A necessity? Yes. But why an evil! Apart from Temperament no system of keys could have been developed: there would be no harmony in the musical sense of this term, which is, strictly speaking, key-harmony; in a word, there would be no music. If Temperament is a *necessary evil*, then key-harmony is a necessary evil, then music itself is a necessary evil.

The musician knows exactly what key-harmony is: he knows that tones in one relation generate this harmony; he knows that tones in another relation generate that harmony: hence there is nothing hypothetical about this key-harmony, and where the facts are so plain and convincing there is no latitude for argument so far as the musician is concerned. What the physical conditions are that combine in generating this or that key-harmony is a problem that directly concerns the physicist. There is no doubt that the investigation of this problem would excite the keenest interest in every thinking musician. Yet, for a moment let us suppose the problem to have been solved, it is not likely that the musician would be more convinced of what he knows to be a fact of every-day experience than he is at present. The sphere of the physicist in music is a wide one, nevertheless it is limited to the investigation of the physical phenomena of music, and it is music and therefore the musician that supplies the physicist with physico-musical problems to investigate. There can be no doubt that every true musician is intensely interested in and deeply grateful for the cumulative facts and investigations of physical science that

relate to music. However, when the physicist undertakes to teach us music and, as has been attempted, when he undertakes to convince us that our music is impure in klang and inexact as a system and should be supplemented by something more pure and exact, he not only steps outside of his sphere but deals in patent and puerile absurdities.

Key-harmony, therefore Temperament, and the sharp and flat system of nomenclature and notation are at loggerheads. The former is a necessity and cannot be improved: the latter is the sign and the name, it misrepresents the tone in most cases, it should be and can be improved on.

My upmediate and downmediate signs provisionally simplify the numerical notation and nomenclature of keyklangs and chord-centers. Moreover, these signs indicate the direction of progression, they at once convey the idea of upmediates and downmediates to the intelligence. In a word, they represent exactly what is intended they should represent. The same symbols have the same meanings in all keys. More than this cannot be done in this writing toward simplifying signs and names for tones.

This *quasi* preface to a new notation may be concluded with a few words to suggest the simplification that would result if each tone in the System had its own name, by which innovation all sharps and flats, together with their perplexing inconsistencies, would at once be entirely eliminated.

If we have a *necessary evil* to contend with, then this evil certainly is the letter answering to a tone. For, what is there in common between the tones a—b—c and their letters? Voice means vowel, tone, klang: hence all musical tones are virtually vowel-sounds. Although a fine ear detects many modifications of vowel sounds in different musical instruments, the klang-color of a single instrument does not, strictly speaking, vary. So far as the letter *b* having any relation to the tone *b* is concerned, except by rote-association, this tone might with equal propriety be named *x*, or *l*, or *p*, or any other letter. Now, since the sole purpose of the letter is to enable us to distinguish tones from one another by separate names; since these names never represent anything akin to the tones to which they are applied and therefore do not denote the exact keyklang, the exact principal, upmediate, or downmediate; since in any case these names have to be learned by rote: why not then, in conformity with Temperament, give to each individual tone an individual name, why not let this name be the same in

whatever relation the corresponding tone may occur, and use the keyklang and chord-center signs to describe the exact relation in which an individual tone with an individual name occurs, as they always do! Would not this greatly simplify nomenclature? Personally I have every reason to believe that it would. Let the reader conceive of a chart like the accompanying one, in which sharps and flats are substituted by plain names that re-appear in a different grouping in each key, and the resulting simplification will not escape observation. The reader will observe furthermore that in such a chart the eight keys which are omitted from the present one may be included, for the obvious reason that their symbols and nomenclature would be as simple as those of all the other keys.

Modulation.

Shift the relations of tones from one key to another, and we leave the keytrack of one key for the keytrack of another key. *Convert any keyklang of one key into a keyklang of another key*, and such a shift of the relations of tones from one key to another is at once effected. This is Modulation.

Since each keyklang gains its distinct character through its key-relation, since the exact conception of a keyklang involves a vivid experience of its mental effect, since the student of this System is trained from the start to form such exact conceptions of keyklangs and learns to think and discriminate keyklangs in all their principal relations at an early period in his studies, it follows that the student of this System encounters no difficulties whatever in the study of our present subject, and that the above definition speaks plainly to his intelligence in explaining exactly what a modulation is and exactly how a modulation is effected. Briefly, it must be plain to every musician that my pupil can with facility start on any keyklang of one key, then think it in relation with another key, thus converting it into a keyklang of another key, and thus obtain a concrete experience of the exact mental effect of a modulation. Subtile and highly complex as the psycho-physical process of Modulation may be, we get at the exact nature of a modulation through its effect on the mind, and when we analyze this effect into its melo-rhythmo-harmonic conditions we get as clear an explanation of the psychical process of modulation as we need for our purely musical purposes. Such analysis will be considered presently.

Meanwhile a few illustrations will suffice to demonstrate that modulations are conceivable, appreciable, and teachable in *one* voice; that, whether or not we know anything concerning the melo-rhythmo-harmonic conditions of a modulation, we can effect and appreciate a modulation in one voice by simply conceiving a key-clang of one key as a keyclang of another key; therefore a student can learn to do this as soon as he knows the keyclangs, and need not wait, as is customary, until he masters four-voiced harmony before entering upon this charming subject, nor need he ever be perplexed by such current phrases as *the introduction of FOREIGN tones* and *the unmistakable MEANS of modulation*. For, as this System plainly demonstrates, there is no such thing as a tone that is *foreign* to a key, all tones in the System playing a part in all keys; again, the phrase *unmistakable means of modulation* is not only absurd in itself but is calculated to encourage mechanical work on the part of students, since it appeals more directly to the mind's eye than to the mind's ear.

Every reader that will think out the following illustrations in one voice will experience the shift of key and the exact mental effect of a modulation: **Ex. 251.**

The exercise consists of nine short musical phrases, each illustrating a modulation from the key of C major. The notes are written on a single staff in treble clef, with fingerings indicated by numbers 1-5 above the notes. Below each phrase, the initial and final key signatures are written.

- a) C — G — (Fingering: 4, 1, 4, 5)
- b) C — B \flat — (Fingering: 4, 1, 2, 1)
- c) C — D \flat — (Fingering: 4, 1, 2, 1)
- d) C — E \flat — (Fingering: 4, 1, 3, 3, 1)
- e) C — D — (Fingering: 5, 2, 4, 1)
- f) C — A — (Fingering: 4, 3, 5, 4, 5)
- g) C — B — (Fingering: 4, 3, 4, 3)
- h) C — F \sharp — (Fingering: 1, 2, 4, 3)
- i) C — E — (Fingering: 4, 3, 1, 2, 1)

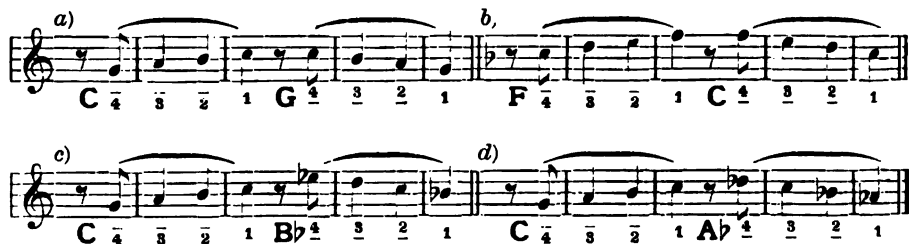
In music some one key presides at all moments, hence tones are always heard, thought, and felt, in relation to some one key-center at all moments. Hereupon it follows that a modulation takes place at the very moment a shift of relation to another key-center takes place, for at this moment the presidency of the initial key ceases to be felt and we feel the relation to a new key-center and key. Therefore:

A modulation takes place at the exact point at which the relation is shifted to another key. This point may be named the modulatory point.

The second capital letter in each of the above illustrations is placed directly under the modulatory point. Were we to stop on this modulatory point by omitting the tone or tones that succeed it, our sense of modulation would be none the less vivid, for on this modulatory point we acutely apperceive the shift of relation to another key, as follows : **Ex. 252.**



The fact that a modulation takes place at the exact moment when the relation is shifted, and is therefore effected directly on the modulatory point, proves beyond question that the process of modulation is an *instantaneous* one. It is therefore an obvious fallacy to claim, as is done in current treatises on this subject, that modulations may be sudden or protracted, and that modulations are not effected until phrases or periods terminate on the Tonic-chord of the new key. In view of the fact that a modulation is instantaneous, it follows as an incontrovertible consequent that a modulation takes place on the *initial* tone of every modulating phrase; in other words, it follows that we get over into a new key, are in the new key, and feel ourselves in the new key, directly on the initial tone of a phrase that modulates. An example will render this point appreciable. **Ex. 253.**



In each of the above illustrations we are in the new key the moment we touch the initial tone of the second phrase. Hence it would be absurd to claim that these modulations are not effected until the modulating phrases are terminated.

These examples and explanations substantially verify the claim which I made in foregoing chapters that modulations are appre-

cialable and teachable in *one* voice. Another claim which was made in a previous chapter, is also proved in the first two of the above illustrations; it is this: modulations may be effected in one voice through *principals* that are common to two keys, and therefore without introducing so-called "foreign tones," or tones that are "foreign" to the initial key. Such a modulation takes place at N. B. in the following melos to a Cradle Song: **Ex. 254.**

Andantino.



This modulation from the key of *G* to the key of *D* is distinctly heard and felt; yet there are no "foreign" tones, no "unmistakable means of modulation," in the melos; the modulating phrase is composed of tones that are among the principals of both keys.

The trained musician hears and feels the above modulation and understands how it is brought about; the beginner in music and the average layman hear and feel it, but do not understand this; the beginner in keyklangs hears and feels it, and he knows that the relation of the keyklangs has been shifted to another key. Consciously or unconsciously, the trained musician, the beginner, and the layman hear and feel the shift of *harmony* that is generated by the shift of relation, our common sense of this shift of harmony is the key to and explanation of our common feeling that a modulation has taken place.

This brings us directly to the analytical stage of our subject, to an investigation of the melo-rhythmo-harmonic conditions of Modulation. The trained musician knows these conditions, he can at once analyze the concomitant harmony of the modulating phrase; his habit of dissecting these conditions has been formed long ago. The beginner in keyklangs is trained by this System to dissect the harmony that a series of keyklangs generates in his mind, and persevering mental practice of this sort soon develops in him the habit to discriminate without stopping to think. But the layman forever remains unconscious and ignorant of these melo-rhythmo-harmonic conditions; yet the fact that he feels and hears the harmony of a modulating phrase is proved in many ways; for example: say his voice is bass, he would sing the natural groundtones to the above melos, and in the last phrase he would sing *A* in the first measure and *D* in the last.

The original harmonic accompaniment to this modulating phrase is as follows : **Ex. 255.**



Whatever changes might be made in the rhythmic and harmonic elaboration of this melos, the natural chord-centers for each of the four measures would be these : **Ex. 256.**



These natural chord-centers represent the natural concomitant harmony of the melos, and the employment of the natural harmony always results in the *pure* style; the selection of other chord-centers would be affectation, artifice, and would result in an *impure* style.

Since every series of tones that we may think is a series of keyklangs; since every such series takes mental form as a central thought, or Prominent Voice; since a keyklang is a tone in relation; since this relation is its key-relation, which gives to each keyklang its characteristic effect; since *relation* means *key-relation*; since every series of keyklangs, or every Prominent Voice, generates its natural concomitant harmony in the mind; since this harmony is distinctively *key-harmony*: it follows:

1. That modulation takes place in the central thought, or Prominent Voice, and that a modulation is inconceivable, unappreciable, and unteachable apart from a Prominent Voice.

2. That when we convert a keyklang of one key into a keyklang of another key, the tones that we have in mind constitute a Prominent Voice together with its concomitant harmony, and therefore we shift the relation of a keyklang *from the harmony of one key to the harmony of another key.*

3. Hence, that a shift of key, or modulation, is simply a shift from the harmony of one key to that of another.

Again: since the student of this System is trained to discriminate keyklangs and their relations, it follows that he can readily and intelligently shift the relation of a keyklang from one key to another. The fact that the student of this System hears and feels the relations of keyklangs plainly demonstrates that he hears and feels their *harmonic* relations, and since this System teaches him to analyze the concomitant harmony of his central thought, or Prominent Voice, it follows that he experiences no insurmountable difficulties in elaborating the harmonies of modulations. Hereupon it is clear that the student of this System requires no such artificial guides as "foreign tones" and "unmistakable means of modulation;" it is plain that the former do not exist, and it is apparent that modulations may be effected without the latter, for modulations are conceivable and occur in great quantities in music works without introducing any of the dissonances which are implied by "unmistakable means of modulation." This latter point is illustrated in the following modulations from *C* to *G* in which the concomitant harmonies of the modulating Prominent Voice are all consonances: **Ex. 257.**

1. P.V. 1 4 3 a) b) etc.
C — G — C — G — C — G —

2. P.V. i 4 3 a) b) c) etc.
C — G — C — G — C — G — C — G —

3. P.V. 1 4 3 a) b) c) etc.
C — G — C — G — C — G — C — G —

The above modulations are as *unmistakable* and appreciable as those below in which dissonances are introduced. **Ex. 258.**

The image shows four musical examples, labeled a), b), c), and d), followed by "etc.". Each example consists of a piano accompaniment with a treble and bass staff. Below the staves, a series of chords is indicated: C — G — C — G — C — G — C — G —. The notation shows various rhythmic patterns and harmonic changes corresponding to these chords.

All that has thus far been said regarding the relation of rhythmic accents to harmony applies to Modulation as well, and a brief consideration of this relation will better prepare us for what still remains to be said in connection with our present subject.

It is plain that any series of keyklangs that we may relation generates its concomitant harmony and always results in a melo-rhythmo-harmonic phrase. The keyklang-series may result in a conventional phrase of melody; it may be of any length; it need not exceed two keyklangs; it may even be some rhythmic device in which the same individual keyklang is repeated like the following sections of the first theme in the *Allegretto* of Beethoven's Seventh Symphony: **Ex. 259.**

The image shows a single musical staff with a treble clef and a 2/4 time signature. It contains a melodic phrase consisting of eight eighth notes, grouped into four pairs by a slur. The notes are: G4, A4, B4, C5, D5, E5, F5, G5.

In every case such a keyklang-series is a phrase of some sort, and as we think from one of its rhythmic accents to another we distinctly hear its concomitant harmony. But no conception of this harmony can be formed unless we think the series as a *whole*. The initial harmony of the series may continue throughout, or the harmony may change once, twice, three times, or still more frequently; in every case this harmony of the series distributes the keyklangs into harmonics and bytones; in every case, the point at which we apperceive the presidency of the harmony of the moment or a shift to another harmony is on the anticipated rhythmic accent, and I have already named this point the *rhythmo-harmonic point*; briefly then, in every case the harmony of a keyklang series is regulated and anticipated as we pass from one rhythmo-harmonic point to another.

Those phrases are simplest in their harmonic constitution in which the keyklangs generate the same harmony throughout. Here are examples of Tonic phrases in which the sign for rhythmic accents is placed over the rhythmo-harmonic points: **Ex. 260.**

a) *Beethoven.* *b) Beethoven.*

c) *Beethoven.* *d) Beethoven.*

e) *Beethoven.* *f) Beethoven.*

g) *Beethoven.* *h) Beethoven.*

i) *Bach.*

Were we to stop on any of the bytones in these phrases, a shift of harmony would at once be initiated, and what was a bytone would thus be converted into an harmonic of another chord. The phrase at *h)* may be taken to illustrate this fact. **Ex. 261.**

The bytone antagonizes the harmony of the moment, and when we stop on such an antagonistic tone, it finds its equilibrium in a new chord of which it is a component. Such shifts of harmony are presented below, and are caused by stopping on a tone that antagonizes the initial harmony. **Ex. 262.**

a) *Beethoven.* b) *Beethoven.*

I ————— uIV I ————— uIV—

c) *Chopin.*

I ————— OII—

Whether this antagonistic tone occurs on or after a rhythmo-harmonic point does not change the case ; for, although the shift of harmony takes place directly on the rhythmo-harmonic point, it is caused by the terminal tone which in each of the above illustrations antagonizes the initial harmony. The first of the above phrases is presented below with its terminal tone after the rhythmo-harmonic point. **Ex. 263.**

I ————— uIV—

This change of the original phrase presents a Suspension of frequent occurrence, which, like all Suspensions, represents simply a delay of resolution.

In the following presentation of this phrase the harmony does not change at all, owing to the terminal tone which accords with the initial harmony. **Ex. 264.**

I —————

When other tones follow upon the entrance of a new harmony, the next rhythmo-harmonic point decides whether this new harmony continues or whether still another harmony is initiated. The conditions that cause a second harmony to be followed by a third, a third by a fourth, and so on, are the same as those that cause the first change of harmony. The following illustrations speak plainly on this point: **Ex. 265.**

a) *Bach.*

A central thought may shift through several keys and then return to the initial key without blotting out of recollection the residence of the initial key. Such modulations are *transitory*; they often occur in a single phrase; they occur in successive phrases where the same phrase is imitated in other keys; they occur in sequences and cadenzas.

Following are illustrations of transitory modulations: **Ex. 266.**

a) *Presto.*

f staccato.

I uIV I uII oIII oII uIV oIII uIII oII uIV I oIV uII

oIII uII oII uIV I oIV uII oIII uIII oII uIV I oIV I uIV I

b) *Beethoven.*

N.B.

A⁷ F B^b A⁷

c) *Schubert.*

G A G

d) *Mendelssohn.*

E-B A



Were we to stop on any of these rhythmico-harmonic points or to continue in a newly initiated key, the modulation would be a *positive* one. This explains why the relation at N. B. is marked in the key of *F*: brief and transitory as this presidency of the key of *F* is, it is unmistakable, and the modulation would be positive were we to halt on the next rhythmico-harmonic point, as follows: **Ex. 267.**



The two classes of modulations are distinguished from one another as follows:

1. *Transitory* modulations are characterized by a return to the initial key; strictly speaking, they do not shift the key: in these modulations, the keyclangs and chords should be thought and marked according to the three Relationships in the initial key. See *a*) in **Ex. 266**.

2. *Positive* modulations directly shift the key. In these modulations, the keyclangs and chords should be thought and marked according to the three Relationships in each succeeding new key.

Below are a few examples of positive modulations: **Ex. 268.**



etc.

ff

Ab

b) *Beethoven.*

p

cresc.

ff

ffp

D

Bb

etc.

c) *Beethoven.*

p

G

D

etc.

Modulations may be effected by a Prominent Voice in many ways. The relations of keyklangs may be shifted from key to key, as follows :

1. From *principals* of any one key to *principals* of other keys.
2. From *principals* of any one key to *primary intermediates* of other keys.
3. From *principals* of any one key to *secondary intermediates* of other keys.
4. From *primary intermediates* of any one key to *principals* of other keys.
5. From *primary intermediates* of any one key to *primary intermediates* of other keys.
6. From *primary intermediates* of any one key to *secondary intermediates* of other keys.

7. From *secondary intermediates* of any one key to *principals* of other keys.

8. From *secondary intermediates* of any one key to *primary intermediates* of other keys.

9. From *secondary intermediates* of any one key to *secondary intermediates* of other keys.

To state the case in another way, we can modulate :

1. From the First Relationship of any one key to the First Relationship, to the Second Relationship, and to the Third Relationship, of other keys.

2. From the Second Relationship of any one key to the First Relationship, Second Relationship, and Third Relationship, of other keys.

3. From the Third Relationship of any one key to the First Relationship, Second Relationship, and Third Relationship, of other keys.

The three Relationships aggregate twenty-seven tones for each key. Since the relation of each of the twenty-seven tones of one key may be shifted to another key, it follows that a Prominent Voice can be modulated from one key to another in twenty-seven ways.

Since there are twenty-six keys to modulate to from any one key, and since there are twenty-seven ways from one key into each of the other keys, there are $26 \times 27 = 702$ ways out of and into any one key.

Since there are twenty-seven keys and seven hundred two ways out of and into each, there are $27 \times 702 = 18,954$ ways in which a Prominent Voice can modulate.

Conclusion.

Although many subjects that directly relate to melo-rhythmoharmony and that have been treated and elaborated in my larger work have been omitted in these pages, my Centralization of the Tonal System and its underlying Principles have been fully presented, and their bearings on the most vital points in the evolution, the theory, the practical and æsthetic education, the physical and psychical nature, the philosophy and the criticism, of music have at least been suggested.

That a full and clear abstract of this System and its Principles for didactic purposes could be compiled in a comparatively few

pages will be obvious to every musician. Moreover, such a text-book would both cover the whole ground and make a smaller volume than has as yet been produced for the purpose of giving the student a comprehensive insight into music.

IN THE SEPTONATE AND THE CENTRALIZATION OF THE TONAL SYSTEM, in its *Principles* and their definitions, in its consistent and complete classifications, in its introduction of an exact nomenclature, in its freedom from hypotheses, mysticisms, and snags: have we not some of the elements and principles for the foundation of an *exact Science of Music*!

Let us recapitulate by briefly reviewing the new Principles and the new tone-structure. In this way my main facts and conclusions will be brought close together, and this will facilitate the task for thinking musicians to pronounce whether or not their value to an exact Music Science has been overstated by me. Moreover, with this summary I hope: 1st, to incite others best qualified rigorously to weigh the evidence on which I have supported my conclusions, with a view to pointing out and proving any imperfections which are likely to be overlooked in a first presentation of new ideas and of so comprehensive a subject; 2d, to encourage further investigation on the lines of inquiry pursued in these pages, which, I firmly believe, point out the only path toward the establishment of a Music Science worthy of the name.

I.

The facts that *tones* are **individual** and **immutable**, and that tones *do not move*, are self-evident. In a Science, self-evident facts are the best sort of facts. Truths, however simple, must be stated and applied. Hitherto this has not been done with the facts in question, and every music thinker acquainted with past and current theories will appreciate the revolution which these self-evident truths bring about and the light which they throw on many old and perplexing problems.

II.

A musical tone is a tone in relation, this relation is its **key-relation**, hence a musical tone is a **keyklang**. Has not the musician always heard, thought, and felt tones as keyklangs! Has not the keyklang always existed! Has not the keyklang an equal theoretical, practical, and æsthetic value!

III.

The position of a *Tonic* is **central**. The relative positions of keyklangs, intervals, scale-halves, Septonates, scales, chords, and keys must therefore be described as **central**, or as **under**, or as **over**. The process of **Centralization** starting with the starting-tone of the System of necessity implicates the whole System.

IV.

So long as such units as the **scalehalf**, the **Septonate**, the **key-group**, and the **tone-stratum** exist, can they be rejected by Music Science? The same must be said of the numbers 4, 7, 17, and 27, which respectively answer to these units.

V.

The *scale* contains **eight** tones instead of *seven*. The **Septonate** is the only perfect unit in **seven** tones and the only unit that presents the *seven principals* in their *primal and nearest relations and positions*. The Septonate clears up and solves the Leading-tone mystery, presents this tone in its primal relation and position, and furnishes solutions of many old and perplexing problems, especially of those melodic and harmonic problems which have arisen in the upper half of the scale and which are brought forward in current theoretical works. ✓

VI.

The **key-triunity** made its appearance in my analysis of the primal relations of tones; its necessary implication in this analysis, and the fact that such a triple relation of keys exists, renders its introduction into Music Science unavoidable.

VII.

A tone is an **harmonic center**, a **central** harmonic generator, a **chord-center**.

VIII.

Have we not an important fact in my distinction between **physical** harmony and **key-harmony**? Can the theoretical and practical significance of this distinction be questioned? There is a physical harmony, or harmony in a state of nature, from which human music is derived, which is therefore at the foundation of human music, and to which the origin of music must be ascribed.

I shall consider this subject of origin presently. There is an *innate physical* harmony, which is adaptation to the physical nature of sound and to which must be attributed the genesis of musical faculty; there is *innate key-harmony*, which is based on *physical* harmony, and which is the common inheritance of all musical mankind. That the musical faculties differ in degree in different individuals and are developed in proportion to inherited potentiality, favorableness of environment, and direct education, goes without saying.

IX.

Every scrap of music is a series of keyklangs, whose relations are *key-relations* and whose harmony is *key-harmony*. Every such series generates its natural concomitant harmony.

X.

The important relations of *dynamics* and *harmony* are disclosed in musical thought, such a thought always taking form, consciously or unconsciously, as a central melos, or **Prominent Voice**, together with its concomitant harmony.

XI.

There are **Three Relationships** of keyklangs. These three Relationships provide the only basis for an exact, a logical, consistent, and complete classification of keyklangs, intervals, chords, scales, keys, and modes.

XII.

Each key is composed of *seven principals*, *ten upmediates*, and *ten downmediates*, and the terms *principal*, *upmediate*, and *downmediate* precisely express the primal relations of the keyklangs they respectively describe.

XIII.

Rhythm in nature and rhythm in music differ in degree, not in kind. The rhythmic faculty is first among the musical faculties; its nature has not only been left imperfectly defined hitherto, but its fundamental operation in all things tonal has been overlooked by the musical theorist, and, as a natural consequence, by naturalists, physicists, psychologists, and philosophers. I therefore invite thinking musicians to weigh carefully my definition, nomenclature, and classification of rhythm, which are new; also the distinctions made

in Chapter II. between *tempo*, rhythm, measure, and meter, some of which are not entirely new. The powerful operation of rhythm is shown in the fact that its accents regulate harmony, and therefore every new rhythmic device on the same series of keyklangs results in an entirely new **melo-rhythmo-harmonic** effect.

XIV.

In all music the coöperation of *rhythm* and *harmony* is constant and inseparable. Rhythmic equilibrium and harmonic equilibrium are regulated at the same point; in other words, the rhythmic and harmonic balance is maintained at the same point; this point is therefore appropriately named the **rhythmo-harmonic point**. The **rhythmo-harmonic point** is the most important factor in the analysis of music.

XV.

Hence the **Principle of rhythmo-harmonic Progression** is the key to all musical problems; its existence and validity are obvious; its necessary implication in establishing the primal relations and positions of keyklangs, its plain indication of the **keytrack** and of *pure* voice-leading, its analysis of all music into **harmonics** and **bytones**, the readiness with which it is comprehended by all young and old, the certainty with which it cultivates a concrete experience and an intelligent recognition of the relation of tones, the certainty with which it develops musical insight and intelligent expression, the power it gives the student to analyze music, plainly demonstrates the scope and importance of this first Principle in Music Science. *In fine*, the many simplifications of the theory and practice of music and the simplification of the Tonal System itself have been pointed out in these pages and speak for themselves.

That we must look to psychology for efficient solutions of musical problems is either directly stated or it is suggested in a thousand ways in all important theoretical works on Music. Such direct statements or suggestions appear in connection with all perplexing problems in the works of G. Weber, Marx, Hauptmann, Richter, Weitzmann, Dehn, Jadassohn, Riemann, and many others; they also appear in abundance in other fields of music literature, such as phil-

osophical and historical writings, essays, criticisms, biographies, and letters, from the pens of a long list of eminent men. A collection of such statements and suggestions would furnish an interesting volume and would show that at all times and in all minds human tone-hearing, tone-thinking, and tone-feeling, in a word, musical feeling and the soul-sense of music were directly appealed to in the solution of problems for which no rules or laws could be defined. In all cases where our masters violate the rules, the refined musical sense had to decide whether these violations were actual or only appeared as violations in the light of the rules. Have we not found some clue in these pages as to what the actual rules are ?

In my preface it was explained that the psychology of music was distinctively *music-psychology*. The analyses which I have presented are distinctively *musico-psychological*. No one but a musician possesses the faculties that are indispensable in musico-psychological analysis. In other words, *music-psychology* is distinctively a *music science* and lies outside of the province of the usual psychologist, who is no musician, and who, because there is no exact science of music, depends on physicists and physiologists for music science. But a Helmholtz and Tyndall, a Ribot and Weismann, are not musicians, nor do they claim to be. With physics the case is the same as with psychology ; the physics of *music* is a distinct science of music, which awaits development. The application of acoustics in the improvement and development of musical instruments has proved a direct and undeniable benefit. Theodore Steinway is said to have remarked that without the researches of Helmholtz he could not have made his pianos so perfect. But the opposite is true of the application of acoustics to the theory of music ; indeed, I regard the introduction of acoustics into music as one of the most, if not the most, effectual hindrance to the development of a true science of music. In music we deal with relations of full, not simple, *musical* tones, with the analysis of *key*-relations, *key*-harmony ; and just as soon as we thus relation tones, all elementary tones vanish from consciousness and are positively not heard, except on a terminal Tonic-harmony. All musical tones are physically constituted alike, and music would be impossible if, while singing or playing the scale, we heard the physical elements in each tone ; for, were this the case, we would apperceive a scale of consecutive fifths and octaves. We all know that these fifths and octaves are not heard, owing to the fact that the tones of the scale are thought and heard in their key-relation. The same is

